

Conservation for Common Man

A Guide to Preservation of Antiquities



J.M.Gandhimathi

Curator, Chemical Conservation & Research Laboratory

Published by

Dr.T.S.Sridhar I.A.S.



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By
Ms.J.M.Gandhimathi,
Curator,
Chemical Conservation and Research Laboratory,
Government Museum, Chennai – 600008.

New Series – General Section – Chemical Conservation – Volume II, 2011

Published by

Dr.T.S.Sridhar IAS.,

**Principal Secretary/Commissioner of Museums,
Government Museum, Chennai – 600 008 Conservation for Common Man**

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Year of Publication: 2011

Number of copies: 1000

© Commissioner of Museums

Price – Rs.110/-

Cover Design and Book Layout

Ms.J.M.Gandhimathi

**Curator,
Chemical Conservation section**

Printed by

**Tharamani Womens Co-op. printing Society,
No. 46, Peters Road,
Royapettah, Chennai-14.**

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FOREWORD

Dr.T.S.Sridhar, Ph.D.,I.A.S.,

*Principal Secretary/Commissioner of Museums,
Government Museum, Chennai-600008.*

Archaeology is the study of human history based on the material remains left behind in various forms – Monuments, Antiquities, Art works, Manuscripts etc., In order to get a clear understanding of the past, it is necessary to preserve these rare specimens in a reasonably good state of conservation. Therefore, the role of conservation in preserving cultural properties becomes significant. Conservation is the term used to denote interventions – both preventive and curative – that are applied on antiquities so as to extend their life span and preserve them for the purpose of study, enjoyment and enlightenment.

The Government Museum, Chennai, One of the best and Oldest State Museums in the country was established in 1851. This multi-purpose Museum is located in 16.25 acres of land with six independent buildings housing 46 Galleries. The multi-faceted Museum is organized under the following sections: Archaeology, Art, Anthropology, Numismatics, Zoology, Botany, Geology and Children's Museum. To preserve the antiquities from destruction, the Chemical Conservation and Research Laboratory was established in the year 1930. This is the first State to have started conservation activity covering a wide range of objects. Beginning with Dr. S. Paramasivam as the first Curator, this laboratory is known for its pioneering work in conservation research and consultancy not only for Government Departments including Archaeological Survey of India, but also to private institutions and individuals. Successive Curators have carried on the initial efforts and continue to serve the cause of preservation of cultural artefacts. A number of programmes, seminars and workshops have been conducted by the laboratory over the years. Starting from the year 1974, it has been conducting the training Course on "Care of Museum Objects" at Chemical Conservation Research Laboratory every year during the month of June. It has trained thousands of conservators and art lovers in preventive conservation. It has also provided consultancy services to leading institutions such as the Raj Bhavan, Madras High Court, Madras University and several Museums including Fort Museum in various aspects of conserving the rare objects.

The National Manuscripts Mission initiated by the Government of India has recognized the Chemical Conservation & Research Laboratory as "Manuscripts Conservation Centre" and authorized it to conduct training programmes. Recently, the Centre conducted a two weeks training programme

"Curative Conservation of Paper and Palm-leaf Manuscripts" from 14.2.2011 to 28.2.2011. As a follow up on this initiative the proposal of the Government Museum, Chennai to declare Government Oriental Manuscripts Library, Chennai - a unit of the State Department of Archaeology – as a Manuscripts Resource Centre [MRC] has been accepted.

Tmt. J.M.Gandhimathi, Curator of the Chemical Conservation and Research Laboratory of the Museum has been taking keen interest in organizing the various activities of the Laboratory with dedication and professional competence. During the last three years of her Curatorship, the Laboratory has conducted several workshops, training courses and exhibitions related to conservation of cultural heritage. The scheme of treating artefacts of the 20 Government Museums in the Districts in a cyclical order has been revived. Similarly, 300 Nos. of Bronze icons repatriated by District Museums to the Government Museum, Chennai have been treated, in many cases for the first time. In order to equip herself with the State of Art in Conservation Technology she was sponsored for the one month long International training programme "Conservation of Sound and Images" (SOIMA) conducted by the ICCROM at New Delhi during November and December 2009. She has participated in several seminars and contributed lectures, papers etc.,

During the last year (2010), the Government of Tamil Nadu organized two major events:

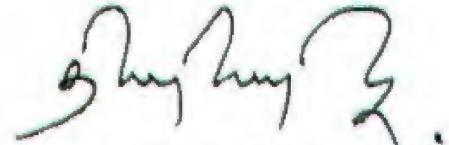
1. ***World Classical Tamil Conference*** at Coimbatore
2. ***Millennium Celebration of the completion of Brahadeeswara Temple –Thanjavur*** in which the Department of Archaeology and Museums participated and organized a special exhibition. The exhibitions consisting of Sculptures, Bronze Objects, Architectural and Anthropological antiquities and manuscripts, painting and other art works was a great success. More than 10 lakhs people visited the exhibition during the event and derived pleasure and benefit. Considering the overwhelming response from public the Government of Tamilnadu extended the period of the exhibition even after completion of the main events, to cater to the huge public demand.

This handbook is aimed primarily at art lovers and persons interested in conservation of rare objects. The main objective is to educate the common man about the essentials of conservation. It is not a book for specialists but a handy guide to those interested in adopting conservation practices at home with limited resources at their command. It is expected to be comprehensible to the layman and general public who will find it useful for carrying out simple treatment for objects needing immediate conservation. I hope this book will be used as source of reference material for the above purpose.

I wish to compliment the Curator, Tmt. J.M.Gandhimathi as well as the other staffs Thiru. J.D. Jaganathan, Lab Assistant and Thiru N.Asokan, Technical Assistant who have contributed significantly to the cause of conservation in general and who have helped meeting the needs of conservators, research scholars and general public.

Chennai- 600 008.

16.3.201



(T.S.Sridhar)



PREFACE

Ms.J.M.Gandhimathi,

Curator,

Chemical Conservation and Research Laboratory,

Government Museum, Chennai-600008.



Conservation is no longer the dusting, brushing, scrapping clean and affixing of missing appendages to the worn out leather puppet or stitching the frayed threads of long forgotten jute costume in the Museum collection. "It has become a widespread public concern for preserving, revealing and studying the past" (Chris Caple 2000). I took charge of the Conservation section with pleasant hopes of shouldering the innumerable responsibilities lying ahead but I was aghast when an unwashed coffee flask was sent to the laboratory for 'cleaning' by a colleague. The conservation laboratory was an emergency clinic not only for museum objects but also to its visitors. Anyone who got hurt was automatically directed to the lab for first aid treatment ! I wondered who the 'conservators' are in the eyes of the people? What do they expect from us? My quest to find answers for these led me to take the principles of conservation to them and find their opinion. To my amazement, I discovered that most of them knew nothing about conservation which forced me to conduct as many awareness programs as possible to advocate its causes. This book is another step in this venture to demystify heritage conservation and make it a mass movement like those for green conservation.

I am obliged to thank our Principal Secretary/Commissioner of Museums, Dr.T.S.Sridhar, IAS, for guiding me in every step of attaining this objective whether it was through starting of Heritage Conservation Club at the museum or attending the many training sessions throughout the country or giving lecture - demos for trainees in various Universities and Organizations. He made it clear that conservation has to be taken to the students, into their classrooms, since they would be the guardians of our cultural heritage in future. Numerous college students both in the urban and rural areas have benefitted from the practical workshops on preventive conservation through the network of district Museums in Tamilnadu. It has been planned to involve housewives, elderly and general public also through the Heritage conservation club to engage them in the 'Protect our cultural heritage movement'. I wish to thank my family members for their support and tolerance without which I would not have found the time to complete this book. My heartfelt gratitude to the doyens in the field of conservation, my colleagues and special thanks to my conservation laboratory staff Mr.J.D.Jeganathan, Mr. N.Asokan, and NMM conservators Mr.Thirunavukkarasu and Mr. Senthil.

(J.M.Gandhimathi)

CHAPTER - 1

INTRODUCTION

I want to remove these stamps from this album and stick them in a better one before the deadline for the assignment...but they tear when I pull. Can you help me..? pleaded Vinodh, carrying an old, brown album gifted by his Grandpa on his birthday.

This antique ivory sculpture displayed in our office lobby has turned brown and dirty. Can you help in cleaning it asked PRO Mr. Ravindran from Egmore. He couldn't believe when I told it was not ivory at all but fake. His boss had purchased it from Taiwan for a hefty prize !

'Could you please put back these documents together. They are our only evidence to prove that the 100 acres of the land in Vellore were gifted to my great grandfather by the British. It is a prime property but we discovered these documents in an old rusted trunk box only recently' ; Mohammed had come all the way from Vellore along with his son and a polythene bag full of brittle fragments of brownish handwritten documents. But I couldn't help him because the jumble of paper pieces was beyond any scope for restoration. Even otherwise, the cost and time to be spent in scrambling the puzzle pieces would only outrun the cost of the prized land which it was supposed to promise.

Mr. Ramachandran and Mrs. Vijayalakshmi were a lovely couple from Besant nagar. They had two bundles of palm-leaf manuscripts which were being preserved by the family for several generations. The bundles of Ramayana with illustrations were well cared for, cleaned and kept with reverence in the Pooja room of their house. Inspite of their efforts they had become brittle and dull. I explained to them that it was because of natural ageing process. Any object has to ultimately breakup and turn into its elemental form. But it is possible to prolong or extend its life by observing certain precautions and preventive care measures. This is known as preventive conservation. We treated their palm-leaf manuscripts in our lab and the couple were greatful to have them in a flexible and bright condition right in time for *Vijayadasami* pooja.

We receive a lot of enquiries from people who come with different kinds of art objects to help them in conserving these treasured items. In most cases the unfortunate condition in which these objects were, could have been prevented if only certain simple but basic procedures have been adopted by their owners. Thousands of precious artifacts are languishing in many households because of lack of awareness about their care and conservation which made me to write this book. My aim is to demystify the word 'conservation' and enable an ordinary man with no scientific or technical knowledge to understand its basic principles and apply them for preserving the cultural assets which they value.

Prevention is always better than cure. A stitch in time saves nine. So I have given importance to preventive conservation than curative conservation... these terms I would be explaining later in this book. This book is not just a DIY (Do It Yourself) book. Most of the procedures can be followed by anybody but I have also cautioned the readers with the warning "**consult a qualified conservator if you have even the slightest doubt**" because it is better if the object is left alone than doing something which would endanger it otherwise.

What is conservation?

The science that deals with increasing the lifespan of a cultural object is known as conservation. It comprises of all steps that are undertaken to protect, preserve, stabilize and maintain a cultural property. Although there are several definitions and interpretations about the word conservation, the most widely acceptable one is by ICOM (International Council of Museums) which states "all measures and actions aimed at safeguarding tangible cultural heritage while ensuring its accessibility to present and future generations. Conservation embraces preventive conservation, remedial conservation and restoration. All measures and actions should respect the significance and the physical properties of the cultural heritage item". Conservation is not all glamour and sophistication; it is hard physical labour requiring a great deal of time and patience.

Preventive conservation

As mentioned earlier, preventive conservation refers to all indirect actions taken to safeguard the preservation of a material. Preventive conservation optimises the environmental conditions in which objects and collections are housed. Controlling light and ultraviolet radiation, humidity and temperature, biological pests, dust and pollutants helps to prevent damage and decay to cultural material. Preventive conservation also means ensuring that good handling, transportation, storage and display techniques are used at all times. Applying preventive methods to the care of cultural artefacts and collections can prolong and protect their life for posterity.

Examples of preventive conservation are appropriate measures and actions for registration, storage, handling, packing and transportation, security, environmental management (light, humidity, pollution and pest control), emergency planning, education of staff, public awareness, legal compliance.

Curative or Remedial conservation

It is an active conservation treatment carried out on the damaged cultural artefacts, a highly skilled field which often involves the use of chemicals and complicated technical procedures. Unless performed with a thorough knowledge of appropriate techniques and with the right equipment and materials, conservation treatments can do more harm than good to the objects being worked upon, and can be hazardous to the people performing the work.

Examples of remedial conservation are disinfection of textiles, desalination of ceramics, de-acidification of paper, dehydration of wet archaeological materials, stabilization of corroded metals, consolidation of mural paintings, removing weeds from mosaics etc.

Restoration

Restoration is another term which is used to refer to all actions directly applied to a single and stable item aimed at facilitating its appreciation, understanding and use (ICOM). Examples of restoration are retouching a painting, reassembling a broken sculpture, reshaping a basket, filling losses on a glass vessel. Almost all antiques reflect their age and you should not expect them to look too perfect. The condition in which you find your antiquity is an important part of its history and value. Do not try to 'restore' your objects to their former complete state by - for example, filling gaps and holes invisibly, or supplying missing parts recycled from other objects which is not only misleading but also dishonest.

In general, any restoration work reduces the value of a piece; limited wear and tear will be preferable and a slightly worn item is usually more valuable than one which has been over-restored. But, if an antique is in danger of deteriorating further because of damage it has sustained, or if its imperfections are preventing its use and enjoyment, it may benefit from limited restoration. If this is the case, always consult a specialist restorer. Unskilled restoration can cause irreversible damage to an antique and may greatly reduce its value.

Who are Conservators?

Conservators are those curious breed of people working in Museums, in official heritage protection services, in private conservation enterprises or independently; who spend most of their time on actively 'treating' objects: removing dirt and deposits that cause damage, strengthening them using physical support or consolidation with resins, removing the chemical products or agents of decay. Conservators have been among the first museum professionals to express their scientific knowledge of risk and the agents of deterioration and how to avoid it. They have also understood the necessity to document and record work affecting objects and collections. Conservators are in general highly educated, well trained, professionally organized, and confident. Conservators are expected to possess a blend of historic and scientific knowledge, manual dexterity, and craft skills. Not only that, but they are also expected to be good at managing tasks, resources, and people. Conservation is an Interdisciplinary field as conservators have backgrounds in the fine arts, sciences (including chemistry, biology, and materials science), and closely related disciplines, such as art history, archaeology, and anthropology. They also have design, fabrication, artistic, and other special skills necessary for the practical application of that knowledge.

If only people appreciated these qualities of an ideal conservator, I would not have been irked by the unwashed flask sent to my Lab by a Curator! By the way, did I mention Curators are always at loggerheads with Conservators? Particularly this happens when the Conservator becomes a

fostermother of the object which he treats, probably because of the volume of time he spends with it, in examining and analysing the problem, taking care and finding solutions for its protection. He is worrying about the state of the stored collections, and thinks they would be better shut away in darkness. Julian Spalding (1999) gives a simple remedy: conservators should have total responsibility for, and charge of, the physical collections, and curators should stop seeing themselves as the owners of the collections and concentrate on understanding how to communicate with the public. Conservators should be responsible not just for keeping the object safe, but for making it safely accessible, too. The conservator's work is guided by ethical standards and some simple ethical guidelines, such as:

- Minimal intervention.
- Appropriate materials and methods that aim to be reversible to reduce possible problems with future treatment, investigation, and use.
- Full documentation of all work undertaken (before, during and after treatment)

Role of the Owners of Cultural objects

There are minor operations of cleaning and repair that the owner can himself undertake only if he is aware of the dangers involved and takes precautions against them. He should also be able to recognize deterioration when he sees it in any form. Above all he should be able to realize when he must call on an expert to get help. No one harms his collections wilfully ; it is only ignorance of the basic principles of methods of preservation which is responsible for much damage. A owner or custodian, therefore, must know what are the various agencies of deterioration, how they act upon objects and what methods can be adopted to control them.

Principles of Preventive Conservation

- Environmental monitoring to ensure appropriate conditions – *temperature, relative humidity, air quality, and light*
- *Integrated pest management* to protect works of art from damage
- Implementing handling and maintenance procedures for storage, exhibition, packing, and transport of works of art
- *Disaster preparedness* for the collection

Preventive Conservation methods can be applied in their simplest form to care for personal collections in the home. The discussions which follow are aimed at explaining these principles to the common man who wants to know how to care for objects which he values most.

CHAPTER – 2

Day-To-Day Conservation

Importance of Conserving Cultural objects

We are fortunate to have the lovely things we call "antiques" in our homes today because our grandmothers and great-grandmothers took tender care of their furniture, textiles, china and silver. These things were more than investments of hard-earned money to them. Often the furniture and household items were handed down to them from another generation as well. Memories of hardship, of travail, of family wealth, or cultural traditions were embodied in the wooden chest your grandmother carefully polished each week, the kanchivaram silk brocade she carefully mended and ironed before putting away for another wedding, the Ramayana palm-leaf bundle she reverently wrapped and unwrapped each *saraswathi pooja*. Or perhaps you own these furnishings now because you hunted in auctions and antique shops for just the right look for your home, and the unknown families who owned them also loved and cared for them a hundred years ago.

We carry on this tradition when we care for our antiques properly. In so doing, the memories are preserved for our own grandchildren and their children. With the proper techniques our special belongings can last another fifty, one hundred or two hundred years and be appreciated for their beauty and usefulness by many more generations. If you are fortunate enough to be in possession of valuable antiques that have survived potential disasters and the ravages of time to make it to your living room, you should know how to keep them in good condition while they are in your care.

Identifying the enemies

Most of the actions you need to take to protect your valued objects are comparatively simple, but require a little bit of knowledge. One of the most important steps towards collections care is to assess the condition of your objects as fully as possible, through examination and observation, and to keep a check on them on a regular basis. This will alert you to changes in their condition so you can take corrective action. The first step is to know what are the enemies of your collections so that strategies can be devised to block and avoid them. The enemies to an antiques collection can be broadly classified into: **Physical Factors**(Light, Temperature, Relative Humidity), **Chemical Factors** (Pollution) and **Biological factors**(moulds, insects and pests including humans).

This might make looking after your antiques sound like a full-time job, but it's all part of the fun of being an owner. It doesn't mean that you have to turn your home into a display cabinet. Just be aware of the optimum environment that will keep your valuables looking as good as they should.

CHAPTER - 3

PHYSICAL Factors of Deterioration

LIGHT

Light is an environmental factor that contributes to the deterioration of our valued collections. It is a form of energy comprising of visible light, UV radiation, which can cause more damage faster than visible light; and infrared radiation, which heats materials. When light and UV radiation falls on an object, various chemical reactions can take place, depending on the amount of energy impacted. These reactions are called photochemical reactions. In some cases it is very easy to see the effects of these reactions. I remember the day when I forgot to remove the red shirt which I had hung in the clothesline in the terrace for drying and ended up with a faded rose coloured one the next day. Try leaving a piece of newsprint in the sun for a few hours and examine the results. The paper becomes discoloured—yellowed and feels different to touch. However, most changes caused by photochemical reactions are not as quick as this nor as obvious; so it is difficult to know they are occurring. Nevertheless their effects can be devastating and ongoing. Some of these chemical reactions continue even after the exposure has stopped or when the material is placed in the dark. Light damage is cumulative.

Light causes extreme and irreversible damage to many materials, most notably organic materials—those that derive from plants and animals which will include furniture, textiles, prints, books, drawings, manuscripts, wallpaper, dyes and inks, feathers and fur. Direct sunlight is a sure way to cause fading, so avoid putting textiles, watercolours and wooden objects in vulnerable positions. Wherever possible, eliminate daylight completely. You can use curtains or blinds over windows and skylights; and use UV-absorbing plastic films on windows and glass doors to eliminate the UV radiation coming into the room from the daylight. Specialist display lights are cheaper and will minimise the damage caused by artificial light. If you use incandescent tungsten spotlights or floodlights, remember: the intensity of the light is greater the closer the light source is to the object; and if the light source is too close to an object, it can cause the temperature to rise, which can lead to damage. Consider installing dimmer switches, so the lighting levels can be adjusted according to the activity taking place.

Measurement of Light

Measure ultra-violet and visible light with an UV monitor or a light meter that measures in lux or foot-candles respectively. To accurately measure the amount of light focused onto the object, hold the meter near the surface of the object with the photo-sensitive cell directed at the light source and follow the manufacturers directions for operating the specific meter in use. In the case of measuring ultra-violet light, the distance between the object and the light source has no influence



on the amount of UV. When measuring visible light note that the illumination level decreases as the distance increases between the object and the light source. Therefore, one way to reduce the amount of visible light on an object is to increase the distance between the object and the light source.

Preventive Measures

In order to minimise damage, lighting levels should be kept low. Keep in mind that the amount of damage caused by photochemical reactions depends on the energy of the radiation as well as the amount of radiation that falls on the material for the entire time it is exposed. Damage to objects and collections cannot always be totally prevented, but the rate of deterioration can be limited and slowed:

- a. Point the light source at a white wall and use the reflected light for illuminating artifacts.
- b. Point the light source between artifacts rather than right at the center of them.
- c. expose objects to light only when necessary
- d. Keep light sensitive objects in storage in the dark!
- e. Rotate the display of light sensitive objects as often as possible to reduce exposure to continuous lighting.
- f. Use lower wattage light bulbs.
- g. Reduce the duration of exposure; turn lights off when not being viewed



RELATIVE HUMIDITY (RH)

What is Relative Humidity?

Relative Humidity is the measurement (expressed in percent) of the moisture in the air as compared to the maximum amount of moisture the air can hold (causing condensation) at that same temperature. Many artifacts in museum collections are composed entirely or in part of humidity sensitive materials. Humidity sensitive materials (especially wood and ivory) react to changes in the atmosphere's relative humidity by changing dimensions.



The effects of extremes and fluctuations in relative humidity

High RH (excessive wetness) - In high relative humidity conditions insects and moulds thrive and reproduce readily, metals corrode, dyes and textiles fade and deteriorate more quickly, organic materials such as wood and leather swell or change shape, and gelatine emulsions and adhesives become sticky. Organic materials absorb water (hygroscopic). This is particularly noticeable in thinner materials, such as paper, vellum and parchment, textiles, leather and bark paintings. As materials

absorb water, they swell and change shape, for example, stretched vellums and mounted textiles sag. The effects of humidity on organic materials are not always immediately noticeable. But after a while, extensive damage eventually occurs. Textiles can display what seems to be the opposite response to changes in relative humidity. A multistrand thread shortens in length when the relative humidity goes up. This is because the individual threads expand in diameter more than they expand in length. The result is that the strands wrap around each other more tightly, which causes the overall length to decrease. Often this process does not reverse when the relative humidity drops again. A canvas responds in the same way as textiles; however, the paint layer on the canvas does not contract. Rather, it will compress, leading to cracking or separation between canvas and paint layer.

Different components of a single object absorb moisture at different rates and swell by different amounts. This can cause problems, such as paint layers splitting and separating from timber panels. Composites of metal and wood are affected also. As the metal corrodes, the wood starts to split in order to accommodate the corrosion products. Adhesives that absorb water become sticky and are an attractive food source for moulds and insects. Gelatine emulsions on photographs also swell in humid conditions and can readily stick to the glass in their frames or, if they are stacked, they can stick together. As for papers which are stuck down at the edges, they will increase in size in humid conditions and thus expand in the middle as their edges are restricted. This can lead to creasing.

Low RH (excessive dryness) - If relative humidity is low shrinkage with warping and cracking of wood and ivory ; embrittlement of paper and adhesives and weakening of textile occur. If fluctuations are occurring constantly, the materials are being subjected to constant movement which is usually not uniform and often results in cracking, splitting and warping. Constant changes in R.H. must be avoided because as a result of this, painted wooden objects will surface by flaking off paint, books will suffer from strain imposed by dimensional changes and salt absorbed in porous material will crystalize. It can also alter the chemical composition of some minerals, so that they become another mineral.

Identifying the problem

Measure temperature and/or relative humidity with monitoring equipment such as a psychrometer, hygrometer, thermometer and/or a recording hygrothermograph. Nowadays digital data loggers are also available. Survey the collection to find out if a temperature/relative humidity problem exists. Look especially at organic materials since they can be expected to react more dramatically to humidity/temperature changes. Do wooden artifacts or wooden doors and windows shrink and crack in the winter? Are skin artifacts shrinking and drying? Is there any mold growing anywhere in the home? These are all signs that a problem exists.

Control of Relative Humidity

Relative humidity (R.H.) is recommended between 55-60%. The ideal method for



the control of R.H. is complete air conditioning i.e. the installation of central unit which regulates both relative humidity and temperature and distributes controlled air. This is expensive both to install and to maintain. A simpler and more economical procedure is to use special unit to control the R.H. in particular areas of the building. These are :

(/) Humidifier i.e. units which introduce moisture if R.H. is too low.

(//) Dehumidifier i.e. units which remove moisture if R.H. is too high.

Buffering materials, such as carpeting, draperies, and upholstery made of natural fibers which are hygroscopic (readily give up and take in moisture) or conditioned silica can contribute to maintenance of a steady RH. Silica gel and other humidity buffers can be used in small enclosed spaces such as display or storage boxes to maintain RH at predetermined levels. Silica gels gives off water when RH falls and absorbs it when RH rises. The colour changes from blue to pink as it absorbs moisture.



TEMPERATURE

What is Temperature

Temperature is a physical property of matter that quantitatively expresses the common notions of hot and cold. Objects of low temperature are cold, while various degrees of higher temperatures are referred to as warm or hot. Quantitatively, temperature is measured with thermometers, which may be calibrated to a variety of temperature scales (Centigrade, Fahrenheit, Kelvin)

The effects of extremes and fluctuations in temperature

Extremes and fluctuations in temperature are potentially less harmful than extremes or fluctuations in relative humidity; but it is difficult to separate the two because they are closely interrelated. Some independent effects of high temperature include:

- increased biological activity. Most insects and moulds thrive and reproduce readily in warmer conditions; and
- acceleration of chemical deterioration processes. Temperature affects the rate at which chemical reactions take place. For example, a temperature rise from 20–30°C may double the rate of some degradation reactions. And this worsens if light, water or pollution also contribute to these chemical reactions.

Preventive measures

Try to keep the room temperature at a constant. Because materials expand and contract at different rates, central heating and the heat from lights can cause much damage. It is best not to place antique furniture near a heat source, because wood is particularly sensitive. Being an organic material, it will contract and split or warp, which makes treatment very difficult. Some types of plastic, for example, vinyl records, shrink and warp in high temperatures.

The most important effect of temperature is the effect it has on altering relative humidity levels. Heating a building in an already dry environment could be disastrous, because it will lower the relative humidity. If you want to raise the temperature without lowering the relative humidity, you need additional water. Additional water sources could include mechanical devices such as humidifiers or, more simply, dishes or trays of water left to evaporate. It is possible to vary the humidity without markedly changing the temperature. Relative humidity can be reduced using a dehumidifier. This is a remedial measure which adjusts a dangerously wet environment.

Controlling Temperature

Airconditioning is the most obvious, but not necessarily the best, method of controlling temperature and relative humidity. The method involves taking air—either fresh air from the outside or recycled air from the inside—and changing its temperature and moisture content.

The building as a buffer zone

Don't despair if your building is not air-conditioned and you can't afford airconditioning. A well maintained building of solid construction provides a very reasonable environment for collections. Make sure your building is well-maintained, so that it provides the maximum possible seal against fluctuations in the outside environment. This is particularly important if the building is made of light building materials and is in a fairly extreme environment. Clean out gutters, drain pipes, repair cracks in walls and ceilings, and have leaky roofs checked. This improves the stability of the temperature and humidity inside.

Storage

Improved conditions for the storage and display of collections can be achieved by choosing good storage and display sites within the building, and using the features of the building to modify conditions. The most stable area of a non-airconditioned building is an internal room on the ground floor— because it is buffered against climatic changes. There are other areas one could choose. Basements are acceptable as they provide a cool temperature. However, they are likely to be damp. Also beware of the risk of flooding during monsoons. On the other hand, an attic would often not be insulated, but would be dry. If there is an optimum choice, the most sensitive objects should be displayed in an internal room, or at least against an internal wall in preference to an external one.

In warm, humid conditions, such as in tropical areas:

- air flow and good ventilation are important if you want to minimise damage to collections;
- use oscillating fans, with doors open to improve air movement; and
- consider other ways of cooling the inside of the building. For example, install interior blinds on windows to limit the amount of heat coming into the building, install exterior shutters or awnings, or put up shade-cloth. If possible, plant trees around the building, but not too close because this gives insects easy access to the building.

CHAPTER - 3

CHEMICAL Factors of Deterioration

Dust and Pollution

Air pollution is another factor to bear in mind, because it tarnishes metal, and damages paper, leather, marble and textiles. Pollution cannot be avoided but you can help by limiting damage. Minimise the gases given off by burning domestic fuels such as gas, wood and coal. Protect silverware from greater damage by cleaning it with tarnish inhibitors, and store glassware and ceramics in a glass cabinet.

There are three main sources of damaging Factors that can affect cultural material:



1) the external environment, that can produce dust and atmospheric pollutants; Sulphur dioxide, salt-laden winds, and carbonaceous material are good examples of pollutants produced in the external environment.

2) the environment inside the home or storage space that can produce dust and pollution through daily activities; Example, dusting a carpet or sweeping with a broomstick which stirs up dust, and

3) materials that are used to store or display objects which can contain harmful chemicals.

Example, Acetic acid or formaldehyde offgassing from wooden display cases, cement dust from a newly constructed building.

Problems with particulate matter

Dust can build up to quite a large mass in areas that are not easily accessible, or which may easily trap airborne dust particles. Dust absorbs moisture readily, so that areas with a large build-up of dust can have quite high local humidity even when the environment surrounding the object is completely stable at 50%RH. In recessed areas, such as between the lower stretcher bar and the canvas of a painting or in the intricate carvings, the build-up of dust creates problems for paint layers. This can lead to cracking and other physical damage as the dust creates physical distortion of the structural components of the object.

Dust on objects will absorb and adsorb pollutants. In conjunction with moisture, absorption of pollutants can lead to severe damage. Dust also attracts and harbours pests—enabling insects to hide and nest in secure environments. Gritty dust causes physical damage, particularly if you clean the dust away by rubbing. It could lead to abrasion and scratching. Sticky dust, for example, soot, will stain most surfaces. Dirt can be absorbed into extremely porous or intricate surfaces such as paper, basketwork and plaster casts which, once dirty, may be impossible to clean.

Carbonaceous material

Carbonaceous particulate matter is produced from several sources including cigarette smoke, car fumes, furnaces and industrial workplaces which burn material. It is often extremely sticky and tarry. If a surface is not porous, carbonaceous particles are quite easy to remove when they first settle. However, if left on an object, their acidity will cause them to etch into the surface. Airborne carbonaceous material is also likely to contain sulphur compounds. Prolonged exposure to cigarette, pipe and tobacco smoke can cause discolouration in many types of antiques which can be tricky to restore. So always keep antiques in a well-ventilated room, and protect them from excessive smoke.

Chlorides

Salt air is a particular problem. While marine environments are the most likely source of salt, there are other sources of chloride contamination of cultural material. These include chlorinated water and areas with high saline concentrations—such as occur in some coastal areas of our country—and sweaty fingers. Chlorides are gritty and will abrade surfaces, but they can also produce chemical reactions. An example of this is the reaction in copper which produces copper chlorides—a highly corrosive substance capable of causing considerable damage to cultural material. This type of damage to copper and bronze objects is commonly known as bronze disease.

Protection from dust

Protecting your collection from the harmful effects of dust is a combination of common sense and expertise. Good building design to keep dust out— together with good housekeeping practices to stop its distribution in display and storage areas—will radically reduce damage from particulate matter.

It is worth developing a strategic plan to identify and deal with problems. The best place to start is to look at the building and its ability to keep out dust. In salty, dusty or dirty environments:

- use air-sealing strips around doors, windows and filter air vents;
- provide doormats for visitors;
- double doors will provide some protection against dust entering the building;
- keep windows closed if possible. This is not always advisable in a tropical climate, because good ventilation is vital to reduce the risk of mould growth; and
- place any objects which are particularly susceptible to abrasion — or are hard to clean — in dust jackets or boxes during storage, and in display cases for exhibition.

And avoid spraying aerosols near objects. These usually contain hydrocarbons and other harmful pollutants. Hydrocarbons react in the presence of air, and become brown and sticky over time, causing irreversible staining.

Many materials are either electrostatic or sticky enough to attract dust. Perspex, Mylar and plastics are good examples of this. Some coatings which are recommended in conservation literature may also be sticky, for example waxes and dressings, or will build up an electrostatic charge, for example, synthetic resins. Seek the advice of a trained conservator before using coatings and resins on cultural objects.

Cases, boxes, slip covers and folders can all be used to protect objects from particulate matter. Cases can be fitted with dust filters; and silicon sealant can be used in loose-fitting cases. Slip covers can be made out of undyed, natural fabrics such as calico. If you have an air conditioning system, it needs to be kept in good condition, and filters checked and changed as necessary. An air-conditioning system which is not maintained properly can cause more damage to a collection than no air-conditioning at all.

Pollutant gases

Industrial pollution occurs in most major cities in the world. Even in small country towns air pollution can be a problem. Sulphur dioxide, nitrogen oxides, carbon dioxide, Hydrogen sulphide and ozone are all pollutant gases. Of these, sulphur dioxide, nitrogen dioxide and ozone cause the most damage. Sulphur dioxide and nitrous oxide are called acidic gases because they react with water to produce acids.

Protecting from atmospheric pollution

- use display cases and layers of storage to provide a protective local environment for the object;
- frame and glaze artworks which are on display;
- provide dust jackets for books;
- place flat paper-based objects in Solander boxes;
- provide archival-quality boxes for fragile or susceptible objects; and
- cover large objects which will not fit in storage cases or boxes with appropriate sheeting, for example, unbleached and undyed cotton or linen, or Tyvek, when they are not on display.

The external environment (Macro Climate)

The first step is to look at the external environment and determine any problems. If one side of the building is near a busy trafficway, you may need to completely seal this side of the building. You may be surrounded by dusty parkland, and so may need to put good seals around doors and windows. You may be in a very polluted environment and so need to have sealed cases to protect your objects.

The internal environment(Micro Climate)

Look at areas which produce dust or pollutants, and work out how these move through your building. Simple solutions—like providing doormats and keeping doors shut; or more complex solutions like adding a double entry door into a collection area—may reduce significantly the movement of dust or pollutants.

CHAPTER - 4

BIOLOGICAL Factors of Deterioration

Insects and micro-organisms(fungus)

In nature, insects and moulds perform the vital task of reducing animal and plant products to reusable chemicals. This is an important part of the cycle of life. There are numerous species of insects and moulds, with an equally huge range of habitats, food sources and behaviours.

Collections in museums, galleries and libraries, as well as possessions in our homes and workplaces provide food and breeding places for insects and moulds. We see them as simple organisms, but in many ways they are more successful than we are in finding food and adapting to the conditions we impose on them. If they are not controlled, insects and moulds can severely damage many types of organic materials in our collections. Dirty, dark and neglected conditions are conducive to insect infestation. Therefore, good housekeeping and regular examination of artifacts is the best protection against the possibility of an insect problem.



What can be done to control moulds?

It is impossible to stop fungal spores falling on objects. Because of this we must concentrate our efforts on making the environment unfavourable for their development into a mould colony. This can be done by controlling the relative humidity—RH. If the relative humidity is maintained at a low enough level—that is, below 65%—spores cannot germinate. It is safer to aim quite a bit lower than 65%, because if the relative humidity hovers around this level, fluctuations in temperature could cause the relative humidity to rise above 65%. Certainly between 45% and 55% is considered safe. If the relative humidity is too low—that is, below 45%—some materials can be damaged.

For information about practical steps you can take to control relative humidity and temperature, please see the chapter on Humidity and Temperature in this book.

In many situations—such as in buildings without air-conditioning—it can be difficult to control temperature and relative humidity. But there are other steps which can be taken. Consider the location of materials which are susceptible to mould infestation. If they are against damp walls or in contact

with cold surfaces, the local relative humidity may be high enough to permit mould growth. Move any items which are likely to be affected in this way, or wrap them and box them to protect them.

Make sure there is adequate ventilation in storage and display areas. Breezeways are vital in tropical areas. Try to make sure all materials which could support mould growth are stored in acid-free wrappers or boxes, or are at least covered with dust covers. Keep objects which are on open display clean. Make sure the microclimates in display cases are suitable and will not create a favourable environment for mould to grow. Inspect collections regularly. Don't let the mould grow for months before you find it. Make sure the building is well maintained. Check for problems such as broken pipes, blocked gutters, rising damp from damaged water mains, broken sewer pipes, inadequate damp coursing and leaky roofs.

How can you save moldy possessions?

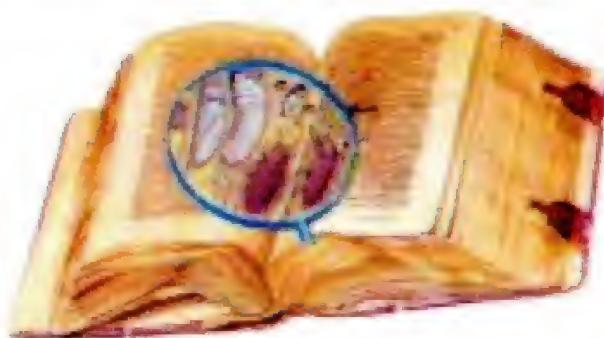
The affected material should be isolated immediately. If possible, place it in a plastic bag and seal the bag. Treat other items which have been in close contact with the affected material in the same way. Throw away acid-free tissue and other storage materials which have been in contact with the affected object. Find out what caused the relative humidity to be high enough to allow mould growth. If you are in a tropical area, the climate is the obvious culprit. But you should also check to make sure that there is no other secondary cause, for example, a leaking water pipe or a blocked gutter overflowing. Take steps to correct the problem. Clear the gutter, buy or borrow a dehumidifier, and change your storage system to allow more ventilation. It is important that you deal with the problem, or it will happen again.

If the outbreak is general and throughout a storage area, you may need to remove all of the items and thoroughly clean the whole area to stop the mould growing again. Fumigate affected items, if possible. Seek the advice of a conservator before doing this, because some fumigants can cause damage. Ideally mould should be killed before it is removed from the object. However, while there is a danger of spreading live spores to other objects, brushing mould off an object is better than leaving it there. Air dry them away from other objects. Spread out papers, stand books on end and fan the pages open. Use blotting materials like clean towels or absorbent paper between layers of cloth or paper. Increase air circulation with a fan, but don't aim the fan directly at the objects. If you can't dry the objects quickly or you have a large quantity, you can freeze books, documents and small textiles until conditions are right to dry them. Do not freeze moldy photographs. Although ultraviolet light can be damaging, brief exposure to sunlight can stop mold growth and aid drying. Exposure should not exceed 30 minutes.

Clean the mold only after it is dry and inactive. Clean objects using the brush vacuum method. This combines gentle brushing with vacuuming. To reduce the suction of the vacuum cleaner, cover the end with one or more layers of a gauze-like material. Then with a soft brush, push the mould toward

the suction pipe of the vacuum cleaner. Never vacuum fragile items. Use a household vacuum cleaner outdoors, since the exhaust will spread mold spores.

Avoid harsh cleaning products and bleach; they can ruin objects. Items may require conservation treatment after mould attack—it is advisable to have them assessed by a conservator. Once the area and the objects affected have been treated, put the objects back into storage in suitable wrappers and boxes. Be sure display and storage areas are free of mold before you return any clean object to its proper place. Continue to check all of your collection. Reinspect the objects from time to time for any new mold growth.



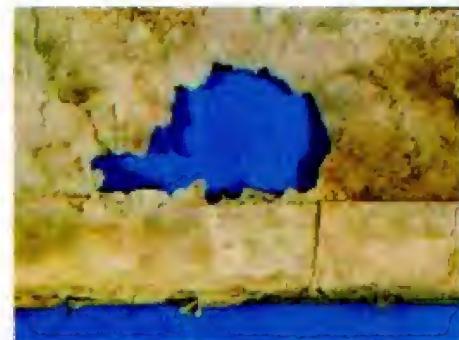
Identifying Insect pests and what they feed

Cigarette beetles	A wide variety of plant and animal-based materials.
Drugstore beetles	A wide variety of plant and animal based materials.
Spider beetles	A variety of plant and animal-based materials.
Carpet beetles	Wool, fur, hair, feathers, silk, insect specimens, books and other products of animal origin, for example, horn.
Green timber borers	Freshly-felled trees.
Green to dry timber borers	Live and freshly-felled trees. They will complete their life-cycle in, and continue to feed on, dry or drying timber.
Dry timber borers	Dried wood.
Powderpost beetle	The sapwood of hardwoods.
Furniture beetle	The sapwood of softwoods; will infest some hardwoods.
Common clothes moths	Wool, fur, hair, silk, dead insects, horn and feathers.
Casemaking clothes moths	Wool, fur, hair, silk, dead insects, horn and feathers.
Cockroaches	Cockroaches will eat just about anything, including leather, hair, skins, paper and books. They also cause damage through regurgitation or by gluing their egg-cases onto objects.
Termites Timber.	Termite damage can be extensive if left undisturbed or if not discovered. Dry wood termites will infest small pieces of timber, and are easily transported in artefacts such as wooden carvings.
Psocids—booklice	Booklice feed mostly on mould growing on old books or dead insects, but they can also damage the surface of materials.
Silverfish	Paper, fabrics—starched or stained material especially—cotton, linen, photographs, book bindings and paste or sizes

Other pests

Mice, rats and birds can also damage collections. Rodents Rats and mice can cause extensive damage to collections, through feeding—gnawing on materials—and through stains from their urine and droppings. Their nests can also become infested with insects.

Birds and Bird droppings can damage collections; their nests can also lead to insect problems.



Control of Insects and pests

Monitor the area regularly. Make the environment undesirable to pests by:

- physical exclusion; packaging to exclude insects, seals around doors and insect screens;
- sealing cracks and other crevices in which insects can hide;
- physical removal—vacuuming; A vacuum cleaner is useful for several reasons: it instantly reduces insect numbers by removing them, their eggs, and any materials they have left behind.
- good housekeeping; A clean environment helps to deter or reduce most pest problems because there will be no food for them.
- maintaining good environmental conditions; and
- applying chemicals as required - biological: insect growth regulators and pheromone attractants; and general pesticides: insecticides, rodenticides and herbicides.



To treat infested material:

- Bag and seal material to contain infestations until the situation is controlled; and
- Freeze infested material, or treat it using one of the alternative methods, such as low oxygen fumigation or vacuum sealing.

CHAPTER - 5

CARE OF ORGANIC COLLECTIONS

TEXTILES

Textiles are prized and collected for many reasons. The value of textiles is found in their association with a person or place, or an interest in the objects themselves and their construction. Textiles are more likely to be damaged during use than at any other time. If you decide to treat your costume items as valuable historical objects, keep them separate from other items and do not wear them at all. Textiles need special care if they are to be preserved for the future.

Recognising Potential Problems

- Light easily damages all types of textiles. Silk is the most vulnerable, but prolonged exposure will cause changes and damage to all fibres such as fading, yellowing and becoming brittle.
- Accessories and related materials such as buttons, chains, sequins, clips etc. may stain a costume item. For example, metals will corrode, tarnish and dull over time. If the corrosion products are 'active' they may start to stain the surrounding fabric. Some plastics have an inherent tendency to degrade and again, the breakdown products can stain surrounding material.
- Bacteria, moulds and insects may cause damage to all textiles such as holes, grazed areas and staining. Presence of protein-rich materials such as starch and food stains coupled with damp conditions, increase the risk of this type of damage.
- Stains, colour-changes and weak areas from wear are particular problems for costume items and can be expected around the neck, cuffs, under the sleeves, at the hem of long garments, and down the front where things are often spilled.
- Crushing, creasing, tears and loose fittings occur because of the way a costume or other item has been stored and packed, or as a result of wearing, alteration or other physical damage.



Handling And Moving Textiles

Textiles are particularly at risk when handled or moved. In general, costume should be handled as little as possible, especially any metal elements, as touching these with bare hands can mark the surface

easily. When you do have to handle costume, the potential for damage can be minimised by laying it out in a clean space with plenty of room. Wear fine cotton or thin vinyl gloves when handling or touching the textile and remove jewellery that may snag. Keep food and drink away and avoid using pens or markers around this area. Use pencil to write labels. When thinking about moving costume and other textiles, plan the task ahead taking into consideration the risks. Support the textile when lifting it (small textiles can be moved on boards or sheets of paper; larger textiles may be rolled round tubes) and make sure that you have a clean and safe space to take the item to. Keep any pieces or decoration which come loose with the item in acid free tissue paper or a small bag, and consult a conservator as soon as possible.

Controlling The Environment

Light, dirt, fluctuating humidity and pests all cause damage. Keep exposure to light, especially daylight (which contains ultraviolet radiation), to a minimum. Limit the length of time your costume pieces are displayed or otherwise exposed to normal domestic conditions. Colour comparison between the front and reverse of a textile or between concealed and exposed areas will indicate whether light damage has occurred. The fading of dyes is irreversible and may also be an indication of damage to the textile fibres. Try to keep humidity levels stable (for example, away from extremes of central heating). Damp conditions (over 65% relative humidity) promote mould growth and heat can make textiles brittle. Poor environmental conditions can also encourage pest activity. Check items on a monthly basis for insects and other problems.

Pest prevention

A variety of pests can cause structural damage to textiles. These pests include clothes moths, carpet beetles, silverfish, firebrats and mice. The larvae of clothes moth and carpet beetles (also known as woolly bears) are particularly damaging to textiles.

In general, good housekeeping is the best method of pest deterrence. When infestation is suspected, sticky traps should be placed on the floor near the storage or display area to monitor the type and numbers of insects present. Periodic inspections and cleaning of storage and display areas provides the cheapest and safest method of prevention. If an infestation is detected, the textile should be isolated and sealed in a plastic bag until a professional conservator can be contacted. The use of pesticides is generally not recommended. Pesticides and their residues are dangerous to humans and can damage many fabrics.

Packing And Storage

The best way to keep costume and textiles safe is to ensure they are properly stored when not in use. Three basic types of storage include flat, rolled and hanging textile storage. Individual textile items and

space availability will influence choices. Ideally storage areas should be clean, dark and have temperature and humidity levels that fall within the recommended range (see environment). Storage in basements and attics should generally be avoided. Routine inspection for dirt and pests should be carried out for all stored collections.

Flat Storage

Flat storage of textiles is highly recommended, particularly for fragile items. Flat storage provides even support that helps to minimize fiber damage. Flat storage systems utilizing drawers, trays, shelves or boxes is recommended. When selecting storage units it is important to choose materials that will not

adversely affect textiles. Wood, uncoated metal shelves and wood-based cardboard boxes should not be placed in direct contact with the textiles.

Recommended materials for storage include baked enamel metal shelving units and acid-free lignin-free boxes.



Ideally, stacking and folding of textiles should be avoided. If folding is unavoidable, folded areas should be padded with acid-free tissue or polyester batting so tight creases do not form.

Rolled Storage

The ideal method of storing rugs, quilts and large flat textiles is to roll the textiles onto tubes. The decorative side of pile carpets, velvet and embroideries should face outside on the roll. Fragile textiles should be layered between acid-free tissue, particularly if the textile is fragile, brittle, or abraded. Layering involves placing tissue on the front surface of the rug and then rolling the rug onto a tube with tissue in place. Wide diameter, acid-free, lignin-free cardboard tubes are available from conservation suppliers. Rolled textiles should be covered with unsized, washed muslin or acid-free tissue.



Hanging Costumes

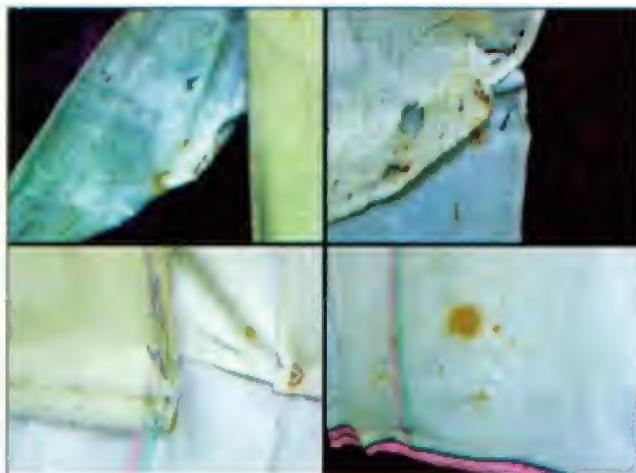
In situations where available storage space is limited, the hanging of costumes can be considered.

However, hanging is not recommended for fragile or heavy costumes. Padded plastic hangers are recommended for the storage of historic costumes. The use of metal and wood hangers should be avoided. Padded hangers are recommended in order to provide a wide surface of support for the costume. All stored textiles should be covered with a pre-washed muslin or Tyvek dust cover.



Caution while cleaning heritage costumes and textiles

Do not attempt to wash anything with detergent or bleach. Bleaching will weaken the textile and modern detergents are designed for modern fabrics; they contain optical brighteners and enzymes which remain in the textile and can damage fragile objects. Even soapflakes may be too alkaline for a textile and cause problems. Do not attempt to 'mend' if your costume has stains, old adhesive or tape repairs, dyes which have bled into the surrounding textile, splits in the fabric, or when the fastenings need replacing or reinforcing.



Arignar Anna's clothes Before treatment



Arignar Anna's clothes After treatment

Special Care for Silk

Although silk is delicate, it is also strong and hard wearing. Like human hair (which is also protein fibres), silk responds to care and attention and reacts to harsh treatment.

Do not leave silk in direct sunlight since ultra-violet light breaks down the protein fibre as well as fading the colours. Wash or dry clean silk regularly before it becomes too soiled as this can also cause a breakdown of the fibres.

Care Tips for Washable Silk

Washing actually improves the feel of most silks: it "refreshes" the fibre and improves the feel. Use a mild soap and cool or warm water. Strong alkaline detergents weaken silk. Wash each garment separately as dyes may bleed.

Handle silk garments gently. Don't wring or twist the garment because silk is weaker when wet. After thorough rinsing, roll the item in a clean bath towel to remove excess moisture.

Don't use presoak products or chlorine bleach; both will damage silk.

Air dry the garment away from sunlight until damp dry. Use a padded or plastic hanger to distribute the weight of the wet garment.

While damp, press the silk item from the wrong side with a dry iron at a warm (silk) setting. A steam iron at a low setting may be used. Iron the fabric dry.

Silk is special. The care you give your silk garments will repay you in prolonged garment life.

CARE AND CONSERVATION OF WOOD

Like any other Organic material wood is susceptible to various factors of deterioration. Wood is most commonly used in making furniture, art pieces, household articles etc and we may have antique collections made of wood of different varieties such as sandalwood, rosewood, teak, mahogany. Most pieces of furniture are complex structures, sometimes made with several different types of materials on the same piece, for example: wood (a spectrum of species), metals, textiles and upholstery, leather, glass, ceramic, tortoiseshell, ivory, paint, varnishes and metal leaf. All of these are at risk from deterioration of some type but, with care, the need for treatment should be infrequent. When undertaking treatment, conservators adopt an approach of 'minimum intervention' and will look for a balance between function, aesthetics and the preservation of the historic finishes and surfaces which have the potential to reveal much about the history of a piece.

Identifying the Causes Of Damage

Temperature and relative humidity

Organic materials such as wood will react to changes in the moisture content of the air around them. Very low relative humidity (dry air) will cause drying out and shrinkage of most timbers; and damage can sometimes result depending on the construction and complexity of the piece. Conversely, a damp environment may result in expansion of the wood. A fluctuating environment has the greatest potential to cause damage as the repeated expansion and contraction of the wood causes stress within the furniture. Cracks and splits in furniture or lifting veneers may be a sign of an unstable environment.



Light

Light and ultra-violet radiation (present in daylight) can cause colour changes to timbers and pigments, and the eventual disintegration of textiles (in case of upholstered furniture). Light damage is cumulative (i.e. it gets worse over time) and irreversible. Comparison of a surface exposed to light with one that is protected (for example a drawer or underside of a piece of furniture) may indicate whether light damage has occurred.

Insects and pests

Pests are another cause of damage. Some timbers (e.g. softwoods, beech, walnut, lime, oak, ash) can be at risk from attack by woodboring insects, especially in damp conditions (above 70% relative humidity), which encourage insect activity and mould/fungal attack. Signs of pest damage include fresh exit holes and the presence of insect residue (which often looks like sawdust), known as 'frass'.

WHAT YOU CAN DO TO PROTECT YOUR WOODEN ARTEFACTS

Environment

Try to maintain a stable environment (temperature and humidity) and avoid placing objects near sources of heat such as radiators as the surrounding air will be very dry. Similarly, try to avoid placing valuable furniture in direct sunlight, use blinds to reduce the amount of daylight or use UV filters on windows. Check your collections regularly for signs of damage. Avoid scratches from sharp things like knives, nails and vases by protecting the surface. In case of tables use coasters or glass table tops (placing small pieces of felt between the glass and table top will stop the glass sticking) and pay particular care to protecting from damage by water and other liquids which can badly affect historic surfaces, especially gilding. Protect from dust by storing or displaying your prized possessions inside glass cabinets. Regular inspection for signs of insect activity such as exit holes is always a good idea.

Cleaning of wood -Damp Cleaning

Although water is not good for wood, there are some circumstances when damp cleaning can be done. A small cotton swab should be wetted with distilled water and squeezed almost dry. It is applied with a rolling motion, lifting dirt off the surface while hardly depositing any water at all. As soon as the swab becomes soiled it should be discarded. This technique should only be used where all else has proved unsatisfactory. It is best used on surfaces which have a sound, intact finish because dampness will raise the grain of bare wood. Small tests on unobtrusive areas should be done to ensure that nothing other than dirt will be removed.



Cleaning Cracks

Old cracks in wooden components become filled with disfiguring and potentially damaging accretions. Removing dirt from such areas is a delicate process that can do more harm than good if not carried out with great care. It is necessary to assess what kind of material one is dealing with, checking to see if it is loose dust, or a heavier accretion like wax polish, dried oil, or varnish. Then the edges of the crack should be checked for soundness; it is unwise to remove dirt if the surrounding wood becomes damaged in the process. In general, loose dirt in cracks in sound wood can be removed using a vacuum cleaner with a thin hose attachment, or by blasting compressed air from the sort of portable container used in the electronics industry. Very fine forceps may also be used to remove more resistant particles, a procedure best carried out under a low magnification. Very resistant material should be left in place if there is any likelihood of damage resulting from its removal.

Cleaning of wooden furnitures

Clean simple polished surfaces and brass fittings by giving them a light dusting with a clean, dry duster (not a feather duster – which can cause scratches); be careful around areas of loss as the surrounding pieces are often loose and easily knocked off. Complex surfaces (marquetry, inlay, boulle, lacquer, painted surfaces and carving) frequently have uneven surfaces; even a slight projection is enough to snag a duster and leave unsightly fibres, or worse, damage from pieces being detached completely. These surfaces should be cleaned using a soft banister brush, or for small areas a pony hair brush. Gilded surfaces which are sound should be cleaned with a soft pony hair brush only after assessing the condition. Metal cleaning products can damage a surrounding wood finish so it is best just to give metal hardware a buff with a clean, dry cloth.

Polishing of furniture should be infrequent; only when needed to buff out marks in wax polish. Use a good furniture wax (with beeswax); apply sparingly with a clean duster and buff with another. The only effective way to stop wood from drying out is to maintain a suitable, stable environment (relative humidity of 40-60%). Avoid the use of spray polishes or those containing silicon as these can damage historic finishes and leave residues. Original finishes are often now prized as a record of patterns of wear and history of use. Their removal can affect monetary value.

Moving and handling furniture

Take care when moving and handling antique furniture. Always plan your route; check that there are no obstructions and that the piece will fit comfortably through doorways and other restricted spaces. The following guidelines can help to prevent damage:

- Check the furniture carefully before attempting to move it. Look out for damage, loose areas and joins.
- Assess the surfaces that will be touched. If so, use clean cotton gloves.
- Separate the object into smaller units; leave nothing which could become detached; lock doors and drawers if they are staying in. Remove any mirrors or glass from the furniture.

- Most furniture will need a minimum of two people to move it safely. Assess the load before lifting (to protect yourself as well as the furniture).
- Always lift a piece of furniture straight up, being sure to handle it at its strongest point (for example legs rather than table tops, and seat rails rather than chair arms). Avoid tipping and dragging as this can put too much strain on legs and feet.
- Carry marble and glass tops and mirrors vertically as they can break under their own weight. To lift a marble top, first move it forward a small distance, then tip onto its back edge supporting the underside; set it down vertically on battens previously laid out near the piece's destination.

CARE AND CONSERVATION OF PRINTS, DRAWINGS AND WATERCOLOURS

Works of art on paper appear in almost every private or public collection and cover a vast range, both in subject matter and value. Paper is primarily made of cellulose in the form of finely broken down plant fibres. In its purest form, cellulose is extremely durable, but preparation methods, additives and impure sources (for example, unpurified wood pulp) can cause the paper to become weak over time. Artists' materials may also be unstable. Pigments can fade, inks can corrode the paper, pastels and charcoal get smudged, and thick paint like oils and gouache can flake.



What can go wrong?

Works of art on paper such as prints, drawings and watercolours can be damaged by light, extreme or fluctuating temperature and relative humidity, pollution, pests, and poor handling, storage and mounting.

Watercolour paintings with a strange colour balance, or ink drawings which have lost their detail have usually been damaged by light. The original colouring can often be found at the edges where the image has been protected from light by a windowmount.

As well as fading media, exposure to light damages the structure of the paper itself.

Temperature affects the speed of the chemical reactions leading to the deterioration of paper. An increase in temperature increases the rate of deterioration, leading to brittleness and darkening of the paper.

The brown spots called 'foxing' are often a sign of a poor environment. These stains are caused by bacteria or mould which generally grows on acidic paper



when the humidity is high, or when there are metallic particles in the paper as a result of the papermaking process.

Insect damage (such as holes in the paper or 'grazed' surfaces) and mould are indications of an uncontrolled environment in which humidity and temperature are high.

Atmospheric pollutants, for example sulphur, can contribute to the breakdown of paper; they can also change artists' colours.

Contact with boards containing unpurified wood pulp may turn paper brown and brittle. 'Mount burn' describes the brown marks around the edge of an image where an acidic windowmount has 'burnt' the paper. Brown 'air-burn' marks can also form through gaps in old wooden backboards. Poor quality mounting and framing damages more works of art on paper than any other agent.

A certain amount of cockling or undulation is usual in handmade paper, but if the work of art is badly distorted, wrinkled or even torn at the corners it has probably been stuck down at the edges. Paper moves naturally in response to changes in humidity and it is best not to restrain it.

Yellow or brown stains on paper, especially in regular patches, can be due to the glue or adhesive tapes used to fix the picture into a mount. Self-adhesive tapes are particularly damaging because the adhesive creeps into the paper and is then extremely difficult to remove.

Avoid the temptation to restore works of art on paper yourself. Dubious traditional remedies such as using bread crumbs to clean off dirt, or the use of commercially produced tapes to repair tears will do more harm than good. Well-meaning attempts have the potential to cause significant damage which can add to the cost of professional treatment or affect the value of your work of art.



What you can do

Environment

Protect framed prints, drawings and watercolours from daylight. Avoid south facing light and use ultraviolet (UV) filtering glass for framing. Try not to hang pictures directly against the interior of the outside wall of a building: the comparatively low temperature can cause condensation and mould growth inside a frame. Conversely, a radiator or spotlight dries the air out, and concentrates dirt by convection currents.

It is best to keep works of art on paper in a cool, stable environment. Museums aim for a temperature of 16-19°C and relative humidity of 45-60%. This may not be possible within a domestic setting, but a low and stable relative humidity (less than 60%) will help to slow the deterioration of the paper and reduce the potential for damage from pests and mould.

Handling

When handling works of art, you should touch the paper as little as possible and keep your fingers away from the image. Pastel and charcoal drawings need extra care because the image may smudge easily: you could consider keeping them permanently framed within a mount that has been rebated to prevent any static or friction. Contemporary prints should not be handled directly either, because their immaculate paper is easily marked with oil and moisture from skin. Keep them in a mount or acid-free paper folder.

Storage

If your prints, drawings and watercolours are not on display, the best way to keep them is in a plain chest or a specially designed case such as a Solander box. The works of art are protected from light and dirt and can be placed in further protective folders inside the box or plain chest for ease of handling. Boxes, folders and portfolios are available in conservation quality materials (inert and sometimes with an alkaline reserve) and should be stored horizontally. Translucent acid-free tissue paper is good for interleaving or wrapping small items. Plastic sleeves are not generally suitable for storing works of art on paper.

When choosing a suitable storage area, bear in mind the need for a stable environment and avoid damp cellars and uninsulated attics. Items in storage should be checked regularly for signs of damage.

Mounting and framing

Good quality mounting and framing is one of the most effective methods of preserving and caring for works of art on paper. As a minimum guide you should think about the following points relating to light and methods of framing.

Light damage is cumulative and irreversible. UV filtering glass or acrylic is highly recommended to protect against the most damaging light. Acrylics such as Perspex™ are useful because they are light and unlikely to break on impact. However, these materials do scratch more easily and because of static, should never be used to glaze pastels, chalks, charcoal or any other friable material.



CARE AND CONSERVATION OF BOOKS

The wide range of books found in collections can include modern paperbacks, cloth-bound hardbacks, leather bindings or even vellum-covered books. Books come in all shapes and sizes and may be rare or ephemeral. Some are in everyday use, whilst others may seldom be looked at. They may have considerable personal or financial value to you as owner, collector or curator.

Books are made from a variety of materials, most of which are natural products. The paper, boards and thread of a book are all composed of cellulose, a plant material. The covers can be made from a wider variety, including skin products (leather, vellum or parchment), textiles or plastic. Some of these materials are of good, durable quality but others have inherent weaknesses and tend to degrade, especially if their storage or display conditions are poor or if they have been used a lot.

What can go wrong?

These are the kind of problems you can detect yourself:

Poor-quality paper may become brittle and yellow. This is usually due to impurities in the cellulose, but it can be made worse by poor storage conditions. Dust collecting on the top edges of books may lead to discolouration and encourage mould growth.



Paper and other organic materials (such as leather) react to changes in the moisture content of surrounding air. The edges of the pages may cockle if the surrounding environment is too damp and conversely, books can also become stiff and brittle if the environment is too dry. A fluctuating environment will stress the structure of a book and cause damage, for example tears and splits at the joints where the book covers join the spine.

Damp and mould provide a favourable environment for insects which eat cellulose: certain insects can bore right through books.



Large books such as family bibles are often poorly made, and so heavy that their boards can split away from the book at the joints. Where pages become loose, they are easily creased, torn and dog-eared.

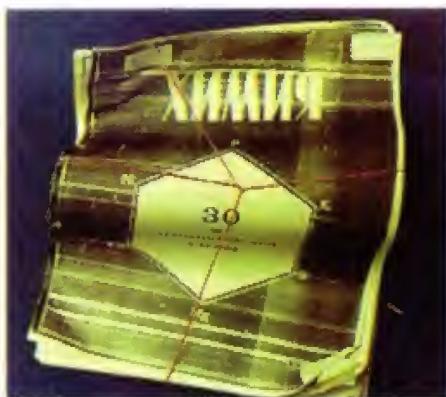
Leather bindings can become sticky and will attract dirt if oils and leather dressings have been over-applied. Leather can also become dry and crumbly. 'Red rot' (where the leather deteriorates to a fine red dust) results from the way the leather was tanned. Books affected by this condition can be boxed or wrapped in acid-free paper to prevent marking of surrounding volumes.



What you can do

Good handling and storage are the best ways to avoid damage. Books are complicated mechanical objects and the way in which they are opened and closed, and manipulated during use influences how long they last.

Handling



Always open a book carefully, without forcing, since the materials it is made from may have become weak over time. Some old books may not open much beyond 90°. Placing books face down on a flat surface will break the binding.

The paper may be weak or damaged, so turn the pages carefully to avoid tearing. Be aware that dirt and oil from your

skin can damage and stain paper. Gloves are sometimes recommended for handling bindings, particularly textile bindings or those with metal clasps, however, gloves can reduce your sensitivity to delicate papers so it is advisable to use clean, dry hands instead for turning pages.

Take care when removing and replacing books from shelves. Headbands are particularly prone to damage as they can be pulled off when removing a book.



Storage

A cool, dry and stable environment is ideal. Temperatures of 16-19°C and a relative humidity of 45-60% are recommended. If it is difficult to achieve this within the home, try to achieve a stable

environment with a relative humidity of less than 60%;

above this, mould and insects can flourish. This

normally means keeping books away from direct heat

sources such as radiators, sources of moisture such

as damp external walls, and avoiding storage in

attics, garages or basements where temperature and

humidity fluctuate, where pests may be a problem and where

leaks and floods are relatively common. Try to protect books

from direct light, especially daylight which can be particularly

damaging. Light damage is irreversible. Store books neatly,

upright on bookshelves and do not allow them to lean

sideways and become distorted. If possible, books should not

come into contact with unsealed wood which can release organic acid

vapours. Line shelves with conservation board (acid-free) to avoid this problem. Make sure that there is good air circulation, for example avoid pushing books to the back of a shelf. This will reduce the risk of condensation and mould developing.



Try to store books of a similar size next to each other so that the volumes are properly supported. Use book ends for support if necessary. Large books are best stored horizontally. Avoid the temptation to pack the shelves tightly as this will make the books vulnerable to damage when you are removing and replacing them from the shelves.

Packing books away

If you need to pack books away, make sure that they are clean and dry, and avoid wrapping them in common household plastics such as bin liners, plastic bags or cling film. These emit harmful gases as they degrade. You can pack books in sturdy cardboard boxes, but be aware that poor-quality papers and card tend to have a high acid content which will cause damage such as paper darkening and becoming brittle if in close contact with books. Valuable books should be stored in archival boxes made from acid-free materials.

Small and medium books can be packed standing upright or lying flat, but never pack books with the front edge (fore-edge) down as this can damage the structure of the book and loosen the binding. Large books should be packed flat. If you need to see what is in a box easily, write a list of the box contents and stick it to the outside of the box. Do not pack the boxes too full, or stack boxes so that they are liable to crush those beneath. Remember to check the contents of boxes periodically (at least annually) for signs of damage. Try to raise boxes off the floor, as this will protect against water damage should leaks occur.

Cleaning

To remove dust from the top edge of a book, hold the volume firmly shut and brush the edge gently from spine to fore-edge using a soft brush. Leather 'dressings' are not generally recommended - these can easily cause a book to become sticky, will attract dirt and may stain. The best way to prevent leather from drying out is to control the environment.

Repairing books

If the binding of a book is broken or pages are falling out, keep them all together by tying the book with linen tape. Do not make repairs to tears with ordinary adhesive tapes or gummed paper as they will be impossible to remove without causing damage and will stain the paper and make it brittle. Unfortunately, well-meaning amateur repairs have the potential to do more harm than good. Similarly, re-binding can reduce the value of a book, both historically through loss of important bibliographic information, and financially. If your book gets wet, stand it on clean, white, absorbent paper with the pages fanned out to dry. If a number of books get wet, contact a conservator immediately.

... of the health of Mr. Morris, indicates that
differences arising from the relative influence of
men and women with and without weight. Mr.
men, he says, "was not considered, in any respect,
due to Governor Wentworth. His growing popu-
lation, and the fame of Mr. Taylor, who, as in
length of years, and his bold and powerful man-
of-preaching, rivaled Mr. Coston, were supposed
to have an small influence upon the general court, in
giving Way to Mr. Hopper and his com-
pany to remove to Connecticut."

... our excellent writers have noticed quite en-
tirely in the actors in these great and such
long, uttered or unexpressed, as are suggested in
statements of Hopper and Thompson. The
long could be more natural, and no change are
to probable.

... nevertheless the existence of such feelings, ex-
pecting them to start, had doubtless their origin and
even in matters lying deeper than...
... It seems clear that on certain impre-
ssive occasions the people who surrounded
Hopper entertained delicate apprehensions from
so prevalent in the Bay country generally. The Bay
country was a distinctly Puritan society in which
a non-conformist was contumacious or obnoxious.

... Hopper arrived in Newbury, though the popu-
lation of the colony was numbered by the thousands.

CARE AND CONSERVATION OF DOCUMENTS AND ARCHIVES

The life of every person is documented in some measure. Families accumulate many documents, commonly including accounts and financial records; wills, contracts and other legal agreements; passports and licences; certificates for births, marriages and deaths, educational awards and other achievements; property deeds, maps and plans; diaries and correspondence; genealogies, scrapbooks and journals; photograph albums; cuttings, notices and other ephemera. Some documents have a legal origin (such as property deeds) and should be kept safely, while others are historically significant (such as plans, accounts, journals and some diaries and correspondence), but all documents can become archives. Few documents are of significant monetary value. Those that are usually have an association with an historically important individual or event. Nevertheless, even the most recent family papers are the historical archives of the future and should be cared for in the same way as old documents. The use of digital information is increasing, but legally binding documents, usually requiring a signature, are still produced in paper (or 'hard copy') format.

What can go wrong?

Most family documents are made of paper, although some (principally old property deeds) are made of parchment, which is a material made from the limed skins of sheep, goats or similar animals. These materials are at risk from damp, mould, insects, pollution, unsuitable packaging and frequent or careless handling. All documents are damaged by light, particularly ultraviolet light which is present in daylight. Paper may become yellow and brittle over time, particularly if exposed to heat and light.

Documents which are handled frequently are at risk of becoming creased, torn and dog-eared. They may also be stained by the grease and oils from fingers which, (in addition to leaving unsightly marks), will attract further dust and dirt.

Papers may become stained from rusting metalware such as staples and paperclips.

Some inks corrode paper: sometimes this will make pages with text weak and vulnerable to further damage, but in extreme cases the ink will 'burn' right through the paper leaving holes where there was once text.

Acidic papers, such as newspaper, not only become yellow and brittle themselves but also discolour any papers with which they are kept in contact.

Photographs can be glass, plastic, paper or metal and need special care. Photographic surfaces are particularly vulnerable and are



easily scratched and marked by greasy fingerprints.

Paper, inks and photographic surfaces are all attractive food sources for insects and pests. Some pests cause significant damage and loss of the paper, others just graze the surface.

Seals are easily damaged because they tend to be bulky and more rigid than the materials they are attached to. They may crack and chip, but they can also cause damage to the document they are attached to, for example by tearing paper, as they are relatively heavy.

what you can do

Frequent handling results in the steady physical wear and tear of the original, possibly resulting in eventual loss of the document. In addition, the documents are vulnerable to damage caused by fluctuating environments and light.

Handling

Old documents should be handled with care, preferably using clean, dry hands. Surgical (or cotton) gloves may be used to protect documents from dirt and grease, though care should be taken with thin and damaged papers as gloves, (particularly cotton gloves), can reduce the user's sensitivity. Folded items suffer from repeated folding and so should be kept flat if possible.



Storage

Documents should be stored in acid-free folders and boxes - ordinary brown envelopes and polythene bags are not suitable.

Single sheets can be stored and handled in clear, archival polyester sleeves although there are risks associated with condensation, static and build up of offset gases from actively decaying paper.



Make sure that documents are clean and dry before packing them away, and carefully remove metal fastenings such

as staples and paperclips if they are corroding and staining the document. Do not be tempted to overfill boxes and try, where possible, to match the size of the box to that of the documents as this will avoid damage due to excessive movement within the box. Label boxes clearly with their content to minimise the need to search through boxes for specific documents.



Storage conditions should be clean, dry (preferably 45-60% relative humidity), cool, dark and stable. It is best to avoid storing boxes of documents next to heat sources such as radiators and sources of moisture such as damp external walls. In practice, this often means avoiding storage in attics, garages or basements where temperature and humidity fluctuate, where pests may be a problem and where leaks and floods are relatively common.

Old documents should be displayed for limited periods only, mounted in acid-free boards, away from sunlight and fluorescent or halogen bulbs, and in low lighting (preferably 50 lux maximum). Check the contents of stored boxes regularly (for example annually) for signs of damage such as mould or pest activity.

Some materials have special storage and display requirements: for example parchment can be damaged if mounted in an inappropriate manner; it should not be treated like paper.

Consider making photographic copies for display, particularly if you want something to be displayed for a long time as this will allow access to information without putting the original document at risk.

Cleaning and repairs

Paper and parchment can be damaged irreversibly by inappropriate treatment. For example, the damage caused by self-adhesive tapes is all too apparent in the yellow staining and sticky residue they leave as they deteriorate. These tapes are extremely difficult to remove and their use should be avoided.

Documents should only be cleaned or repaired by trained conservators. Prevention is better than cure: your contribution towards careful storage and use will help to avoid the need for conservation treatment.

CARE AND CONSERVATION OF LEATHER



The appropriate treatment of a leather item depends upon its condition, or the degree of deterioration when treatment is started.

Leather deteriorates largely by four means:

Oxidation is most readily seen in very old dry leather, with surface cracking and flaking, and over-all weakness. Oxidation will eventually turn leather to dust. Leather items should not be sealed in a display case and forgotten.

Chemical damage can be through the effect of ultraviolet light, ozone, acid from sulphurous and nitrous pollutants in the air. Both oxidation and chemical damage occur faster at higher temperatures. Leather should be stored away from heat, and not needlessly exposed to sunlight.

Internal chafing or breaking of fibres occurs when dry leather is flexed. A lubricant is essential to allow the fibres to slide one against the other. Dry leather should not be flexed prior to thorough lubrication.

Abrasion can be external, from rubbing on the outside, or internal from dirt particles ground into the leather.

Cleaning Leather

Remove surface grime from the leather with a dry white cloth or a soft-bristled brush. Wipe the entire surface with a soft white cloth to remove dust. Never use leather wipes or furniture polish on antique leather, as they contain elements that damage delicate finishes. We use castor oil mixed in rectified spirit to clean leather puppets at our lab. Rectified spirit not only cleans surface dirt but also acts as a carrier of the denser castor oil which penetrates into the pores of the leather when swabbed with a clean cloth. In older instruments the leather is likely to be vegetable tanned and thus moderately resistant to water. It can be cleaned with a damp swab, but dry cleaning with a brush should be done first to ascertain the adhesive qualities of the dirt. Applying a solution of a neutral detergent (less than 1% in water) on a damp swab is most effective on leather which has a smooth, intact surface. Raw hide and parchment materials can only be cleaned dry. One should begin with a soft brush and a small vacuum cleaner to remove loose surface dirt. If necessary a stiffer brush may be used if the surface permits.



Restoring antique leather is a delicate task requiring patience and attention to detail, but the rewards are well worth the effort. Whether you're spiffing up a camelhide handbag, bringing new life to an inherited club chair, or rescuing a *Murasu* (percussion instrument) that languished too long in your village temple, the principles are the same. Clean, restore, condition and maintain. Just be careful not to overdo your restoration.



*Leather Painting
Before.....*



During... and



After treatment

CARE AND CONSERVATION OF BONE AND IVORY

Ivory was used to make a wide variety of ornamental and household products either as carvings or inlays. Formed from the dentin of elephant, walrus and hippo tusks, the popularity of ivory has dropped dramatically in the past years. The sale and importation of ivory is strictly prohibited today, occasionally even banned due to the endangerment of the animals the ivory comes from. Today, most of the ivory that is found in homes comes from antiques, and as any avid antique collector knows, the proper care of ivory is essential to preserving the piece. Many useful and decorative objects are made of bone, including sword and knife handles and miniature carvings. Like ivory, it is an animal product and must be treated with special care.



Monitor the temperature and humidity it is exposed to, especially antique ivory. Ivory is one substance that is highly sensitive to humidity and temperature changes. In order to prevent the ivory from shrinking and swelling, it must be kept in an environment where the temperature and humidity are consistent. Low humidity will cause the ivory to dry out, shrink and crack. High humidity will cause it to

warp and expand. High heat will result in a color change. Conditions between 45 and 55 percent humidity and temperatures between 60 and 70 degrees Fahrenheit are recommended.

Don't expose it to direct sunlight. Ivory, like most substances, will fade when exposed to excessive direct sunlight. However, in order for it to retain the warm, white color, it must be exposed to some indirect sunlight. Keeping the ivory in a dark place will cause it to darken and yellow. Some slight darkening over time is to be expected, but keeping the ivory in a dark room, away from sunlight, will quicken the process and darken it further. However, be mindful not to leave it exposed to too much light. Excessive light will raise the temperature and lower the humidity, ruining its natural coloring and contributing to cracks.

Wear gloves. When handling ivory, it is recommended that you wear gloves, especially if handling antique pieces. Ivory is a naturally porous material and it can easily soak up the natural oils from your hands. To avoid staining the ivory, it's best to use gloves whenever handling.

Although bone, ivory and horn are relatively resistant to moisture, it is advisable to try mild mechanical cleaning methods before using solvents. The cleaning method will be dictated by the condition of the surface and the extent of cleaning desired. Only under extreme conditions will it be necessary to use strong solvents and it is best to consult a conservator. Normal dirt can usually be removed mechanically with less aggressive methods. Deposits of dirt in cracks in ivory can be removed carefully with sharpened wooden picks. Metal tools should not be used. Caution in cleaning highly carved and decorated ivory is recommended because removing all accretions in the lower relief of the design can leave a bland and uninteresting appearance. Yellowing of ivory is usually not reversible by any cleaning method.



Elephant Tusk with stains



Krishna – carved ivory sculpture

CHAPTER – 6

INORGANIC COLLECTIONS (METALS, STONE, CERAMIC, TERRACOTTA)

Care and Conservation of Metal Artefacts

A number of metals were used in antiquity, both pure and as alloys. Metals can deteriorate by chemical and physical means. All except the most noble metals will react with air and corrode causing damages in varying degrees; from discolouration to disintegration.

Causes of damage

An important factor in the corrosion of metals is the presence of moisture which induces oxidation reactions. Corrosion is also initiated by pollutants in atmosphere and other activating influences such as attached metal or alloys on the decorative item. Metal objects can also be damaged physically by surface damages such as scratches, abrasions, dents cracks, deformation of the structure or breakage. Mishandling, improper methods of storage and transport and sometimes amateur attempts to repair may cause irreversible damages to the metal artefacts. Details are given below of the main types of metals found in antiquarian context and methods of taking care of them.

Conservation treatments for metal may be divided broadly into three categories: cleaning, stabilization, and coating.

Cleaning. This can be achieved mechanically, chemically, electrolytically, or electrochemically. For the purposes of these notes, mechanical cleaning in the form of abrasive removal is the primary technique recommended. Products available for this include cloths, pastes, waddings, and fluids.

Stabilization. This may be done with or without corrosion products in place. It can involve removing harmful material from the metal, or applying a protective layer to the surface that lowers its reactivity. The protective layer is chemically bonded to the metal and should not be confused with the physical barrier provided by coatings.

Coating. This is the application of a surface layer (lacquer, wax, or paint) in order to isolate the metal from any hostile aspects of its environment. A coating can protect against pollutants, dust, and the residues from handling, but is never a complete barrier. Small flaws or breaks in the coating can actually induce pitting corrosion.

Let us leave the other two procedures of stabilization and protective coating to conservators and know the basic preventive care of metals by cleaning, which can be done with limited materials and equipment.

GOLD

1. Gold is found in nature in the metallic condition as a rich yellow, soft metal, commonly associated with quartz and certain sands. Pure gold does not corrode and is not dissolved under natural conditions. In objects such as coins and jewelry, gold is often alloyed with baser metals, like silver and copper, giving these objects differing colors depending on the proportion of metals. It is the copper and silver of such gold alloys that corrode.
2. Golden artifacts should not be cleaned beyond dusting with a soft cloth. Do not attempt to reshape crusted or dented gold as it may be too brittle to handle and the metal might break.



SILVER

The word 'silver' often conjures thoughts of treasure and very high-value objects. In fact, items made from this precious metal are more common than you might imagine and most people will own something made of silver: a small trophy, a coin, jewellery or a table ornament or implement. Silver has an attractive colour and will take a high polish. It can be worked in many ways: shaped by hammering or turning, or cast into intricate shapes



Problem

'Tarnish' appears as gradual discolouration and loss of polish, the metal turning gradually to a very dark grey or black with a slight iridescent sheen. This is caused by sulphur compounds in the atmosphere, originating from the burning of fossil fuels and other industrial activity. Humans are also agents in producing tarnish – the salts and greases in our skin are highly corrosive and can mark a polished surface irreversibly. Under extremely harsh conditions such as storage under prolonged damp conditions or severe neglect, you may also see crusty, green-coloured deposits which should be left to the conservator to deal with.

Prevention

- Avoid bringing silver into long-term contact with protein-based materials such as wool, silk or leather when choosing materials to store or display silver; these contain sulphur compounds.

- You can use sulphur-absorbing materials in a case to slow down tarnishing, e.g. Charcoal Cloth, Silver Safe, or copper-impregnated plastic films.
- Use clean cotton gloves to handle silver items – especially when it is highly polished and at its most reactive.
- Keep silver dust-free using a soft, clean, lint-free cloth or a very soft hair brush. Dust can attract moisture and initiate the tarnish or corrosion cycle.
- Know your collection. Which items are valuable – historically, personally, financially? You should not attempt to remove even tarnish from these yourself if you value them, but trust them to a specialist metals conservator.
- If the tarnish is *light* then you may wish to remove it with a commercial silver cleaning cloth. This will remove dust, light sticky or greasy deposits and the dulling tarnish leaving a brightly polished finish. Bear in mind that each time you do this you are removing a little of the original surface.
- Keep the environment around your objects well ventilated and dry as dampness causes corrosion.
- When moving an item, use two hands around the body of a vessel and do not pick up by the handles, which are often weakened with age and use.

IRON

The usual form of chemical corrosion is oxidation, where the iron links with oxygen to form rust. Rust has a greater volume than iron and its formation can cause large pressures to build up where rusting takes place in confined spaces. The rate of chemical corrosion can be affected by the presence of different metals in contact with iron. Copper or bronze for example can promote or accelerate corrosion, whereas zinc or aluminium can reduce it. Chemical corrosion can also be made much worse by the presence of chloride ions (as found in common salt – particularly sea-side conditions) or some atmospheric pollutants



Preventing Damage

Rusting stops if the relative humidity around an object is low enough. Consider re-locating particularly important objects to a more controlled and drier environment. Professional help should be sought if an object appears to be brittle. Damaged iron objects should be repaired as quickly as possible after the event, so that chemical corrosion does not have a chance to set in.

Generally, chemical corrosion can be avoided by preventing either oxygen or water coming into contact with the ironwork; this is usually (and traditionally) achieved by painting. Maintenance of the paint coating therefore is the best way of avoiding problems, since most Architectural Ironwork will have been painted when new. Care should be taken however, not to over-paint heavily-corroded

surfaces; this can create air and moisture pockets, causing the creation of an aggressive micro-climate that will increase the rate of corrosion. Iron artefacts can also be coated with wax, varnishes and consolidants like paraloid B72 or PVA (Poly vinyl acetate)

Cleaning Iron

It is extremely easy to either over-clean or under-clean ironwork. Over-cleaning can damage decorative elements made from softer metals, or destroy protective coatings like galvanising. Under-cleaning will reduce the life expectancy of the coating and predispose the item to re-rusting. Soft abrasives like pumice powder mixed with kerosene can be used to clean the rusted surface followed by a protective coating after thorough drying.

BRONZE

Bronze is considerably less brittle than iron. Bronze ages well and acquires its own patina in various shades of brown or blue-green. Typically bronze only oxidizes superficially; once a copper oxide (eventually becoming copper carbonate) layer is formed, the underlying metal is protected from further corrosion. If exposed to unfavourable humid conditions, bright green spots - sometimes called bronze disease - starts in a small area and spread swiftly like a rash to cover the whole object. Remove the corrosion either by scraping carefully with a knife or by heavy rubbing with a brass brush. Do not use a steel or wire brush, which can damage the antique surface and cause the corrosion to reappear later. Antique bronzes and sculptures should be conserved and restored by a skilled conservator who will be able to stabilize the corrosion products and apply a protective coating to prevent further damage. In general bronze needs no polishing, but wipe it occasionally with a soft, dry cloth.



COPPER

Copper is a soft metal that is pinkish in colour when very clean, but soon tarnishes to an orange/red. Copper can acquire a natural patina that is very attractive and quite stable. Improper handling and other sources of contamination, however, cause a patchy and unpleasant appearance. Copper does not rust, but it stains easily and water makes black spots on it. Soot in moist air reacts with the metal to produce a green deposit called 'verdigris'. Clean off verdigris and dirt by rubbing hard with a paste of powdered chalk and methylated spirits on a soft cloth. Use a fine steel wool on stubborn areas, but beware not to scratch your antique piece in the process.

BRASS

Brasses are alloys of mainly copper and zinc. Standard brass (also known as cartridge brass) contains 70% copper and 30% zinc. Brass objects also acquire a stable patina, often a rich brown colour, although handling and other sources of contamination cause unattractive surfaces to develop.

CLEANING AND POLISHING METALS

Surface dirt can often be removed using a very soft toothbrush or artist's brush. There are two ways to remove accumulated surface grime. The first is to use lukewarm distilled water with a mild liquid detergent and a soft cloth. Be careful to avoid scrubbing too hard because this may scratch the surface if there are particles of grit in the cloth. Rinse with distilled water and allow to air dry on paper towels. If this is not sufficient, greasy residues can be removed with a mixture of equal parts distilled water and alcohol. This can be applied with a stencil brush, cotton swabs or a soft cotton cloth. Rinse in distilled water and let dry.

Polishing will remove tarnish. Because all metal polishes contain abrasives, they will also remove some of the metal. Over-polishing can, therefore, result in the loss of surface detail. If excess metal polish has been used in the past, there may be a build-up of residue in detailed areas. This is usually greyish-white or greenish-white in colour. Such residues should be removed. Delicate engravings might be rubbed away using metal polishes so in this case, vegetable oil on a cloth and some extra rubbing will be a better option to bring it to a shine. On deeply engraved antique pieces, use a medium-soft toothbrush to get metal polish into all parts, then with a soft brush inside a duster to get it out. Finish with a soft cloth.



CARE AND CONSERVATION OF COINS AND MEDALS

Introduction

Coins and medals are popular items to collect. Often there are family histories and anecdotes connected to these objects. Because of their small size, coins and medals are easy to store without requiring too much space.

Traditionally, coins have been made from three metals and their alloys: gold, silver and copper. The alloys vary: silver or copper in gold coins; copper in silver ones; and tin or zinc in copper coins. This

last group is often referred to as "bronzes." In recent years, additional metals — iron, aluminum and copper-nickel alloys — have been used in coin production.

Causes of Damage

All coins and medals (except relatively pure gold) are likely to show some deterioration over time, especially if stored in damp or polluted conditions. Dampness is especially damaging for iron and for coins that have been buried because it encourages corrosion. Sometimes, the corrosion products on the metal surface will contain salts absorbed from the soil that allow corrosion of any remaining metal to continue if moisture is present.

The accumulation of chloride ions on archaeological coins made of copper or its alloys can result in a condition called "bronze disease."

Bright powdery green spots appear on the surface. If this corrosion process is not corrected, it can destroy the coin. Such corrosion problems should be treated by a conservator.

Pollution also damages coins and medals. Many materials used in manufacturing everyday objects, including furniture, emit organic acids into the air. These organic acids cause zinc and lead to corrode, resulting in a covering of white crystals. This corrosion is difficult to stop unless the source of the organic acids is removed. Copper and silver will tarnish in reaction with hydrogen sulphide, a pollutant given off by decaying animal matter (which is naturally present in the atmosphere). However, some paints, textiles and other household materials also emit some sulphur-containing organic compounds and these also cause copper and silver to tarnish. Light can damage the ribbons that are attached to medals. Silk is especially prone to fading.



Handling and Storage

It is best to handle coins and medals by their edges and, if possible, to wear cotton or polyethylene gloves (not latex). Gloves protect the metal from the corrosive oils and acids found on our hands. This is particularly important with proof coins, which have a mirror-like surface, because any mark on them can disfigure the coin and lessen its value.

Coins are best stored individually in coin holders called "flips" made of Mylar, a stable plastic. These holders have two pockets: one for the coin and one that can hold a piece of paper where you can write information about the coin. They come in a variety of sizes.

Somewhat more commonly available are cardboard holders lined with Mylar. These have a circle cut out in the middle that is covered with Mylar. The coin is placed on the Mylar "window" and the other half of the cardboard holder is folded over and stapled on three sides. Both sides of the coin are then visible through the Mylar. Be careful to flatten the staples against the card so that they do not scratch other coins they might come into contact with. Although the cardboard is not acid-free, it does not come into contact with the coin's surface. For the majority of coins, this kind of holder is fine.

Avoid flips and other kinds of holders made of polyvinyl chloride (PVC) because they can lead to corrosion of coins over the long term. Coin albums are not recommended because it can be awkward to remove coins from the pockets (they are usually open at the top, increasing the likelihood of coins slipping out when the album is open). Believe it or not, one of the easiest ways to store coins or medals is in individual polyethylene zip-lock bags. They protect coins or medals from scratches and from sulphur-containing compounds in the air that can cause tarnish. Many medals come with their own presentation cases. These are an important part of the object's history and value and, although the medal should not be stored in the presentation box, they should be kept together. Medals can also be stored in Mylar flips or holders. If you have medals without cases, you may want to consider using clear polystyrene boxes (available at plastic supply houses). These are affordable and provide good protection. Use a soft, nonabrasive packing material such as acid-free tissue to line the box.

Wooden coin cabinets not recommended for storing either coins or medals. They can emit acidic vapours that will cause corrosion. Instead, use metal storage cabinets (preferably with a powder coating) or containers made of either polyethylene or polystyrene.



Cleaning and Repair

Most numismatists advise against cleaning coins. They often have patinas, toning and tarnish that can develop on the surface of a coin over time. Certain kinds of light tarnishing, called toning, are considered part of a coin's value. In the case of proof coins, it is very difficult to do anything that will not hurt the coin. Removing surface dirt from a coin is about the only cleaning that should be done. When handling or cleaning coins, you should wear cotton or polyethylene gloves (not latex). To remove surface dirt, wash the coin in lukewarm distilled water with a mild liquid soap. Do not scrub the surface. To rinse, use a cotton swab dipped in distilled water. Regular tap water contains chlorine,

which can leave chloride on the surface of the coin that eventually leads to corrosion. After cleaning, use another cotton swab and acetone to remove any grease (this is called degreasing) that may remain on the surface. Because of its toxicity, acetone should only be used in a well-ventilated area. Allow coins to air dry on a paper towel.

The approach to medals is slightly different. It is desirable to maintain the bright surfaces of silver medals, but care needs to be taken with the ribbons that are attached to them. It is advisable to wear cotton or polyethylene gloves (not latex) when handling medals. For surface dirt, use a cotton swab to apply a mild liquid soap to the surface. Rub gently to remove dirt and rinse well in distilled water. Let the medal air dry on a paper towel. Silver medals with light tarnish and bronze medals can be cleaned by rubbing a piece of soft cloth gently and evenly over the surface. After cleaning, degrease the surface of the medal using a cotton swab and acetone. Let the medal air dry on a paper towel.



CARE AND CONSERVATION OF CERAMIC AND GLASS

Ceramic

Ceramic is a broad term covering all types of fired clay, including terracotta, earthenware, stoneware and porcelain. All are made of various types of clay with or without additives; some may be painted, glazed and enamelled or gilded. Ceramic objects include utilitarian and decorative vessels, and sculpture and dolls.



Glass

Glass is another broad term, covering a number of materials (glass, glazes, enamel and Egyptian faience) made from silica (sand), alkali (soda or potash), and calcium (lime). Glass may be clear and colourless, or may be coloured by the addition of metallic oxides. Lead glass, produced by the addition of lead oxide to produce a 'soft' sparkling glass which is easily cut, is often referred to as 'crystal'. Glass can be decorated in the molten or hard state; the effects are many. Glass objects include utilitarian and decorative vessels, sculpture, enamel boxes, chandeliers, mirrors, and reverse paintings on glass.

TYPES OF DAMAGE

Compared with other materials such as textiles and metals, ceramic and glass are generally stable and are not readily subject to variations in the environment. However, being brittle, they are easily broken. The most usual damage is breakage caused by the objects being washed, transported in inadequate packing, dropped, or by being knocked off shelves during dusting, or by children, pets or curtains. Fortunately, there is much that individual owners can do to prevent such damage from occurring.

Display

Display cabinets offer the best protection for ceramic and glass objects. Objects on open display should not be propped up against one another or shelves overcrowded. Plate stands must be substantial enough to counterbalance the weight of the plate and plate hangers should be of the plastic-covered wire variety. If your object has been previously mended, a plate hanger may put too much pressure on the repairs so should not be used. If possible, display cabinets should be placed away from areas of heavy foot traffic such as hallways to minimise vibrations, and away from areas of fluctuating temperature (e.g. radiators).

Handling

Try to keep handling to a minimum. Before moving objects, remove any loose clothing or jewellery which may snag on objects and ensure that your hands are clean as porous ceramics absorb grease and dirt. Ceramic and glass objects should be handled with care, using both hands and being careful to set objects down gently. Lids should be removed before handling teapots and objects should not be lifted by knobs, arms, handles or their rims which are areas of potential weakness. If objects are being moved, for example to another room, it is advisable to pack them in tissue in a box or basket before transporting them. Always make sure you have a clear and safe space to take the item to, before you move it.

Cleaning

First, inspect for old repairs and restorations. Repaired or restored ceramics and glass should not be washed, merely dusted or occasionally wiped over with a damp cloth.

Ceramic and glass objects can be dusted using a soft sable brush, holding the object with one hand. Dry cotton wool or cloths will catch on rough surfaces, leaving filaments of fibres behind, and possibly causing damage. Higher-fired wares such as stoneware or porcelain may be washed in water, but only after careful inspection of their condition and stability. Use a plastic bowl (or pad the sink and taps), and make sure that only one object is in the bowl or sink at a time. Use tepid water with a few drops of mild detergent and rinse well with clean water, leaving to dry naturally on a well-padded draining area. Take care to ensure that undue pressure is not placed on rims or stems, and that the object is not at risk of over-balancing.

Do not use water to clean partially glazed earthenware, objects with deteriorating or flaking glaze, damaged pieces with chips, cracks, breaks or old restoration, objects with metal mounts, unfired painted and gilded decoration

Dealing with broken parts

Wrap each piece separately in white, acid-free tissue paper, and place them in a clearly labelled box. Don't forget to collect even the tiniest chips! Do not try to fit the pieces together as more damage can be done by grating the edges together; do not tape fragments together or onto paper as tape is difficult to remove and may damage gilding or fragile surfaces. The sooner a broken item is taken to a

conservator, the better. Ceramic and glass will not normally deteriorate whilst awaiting repair, but edges are likely to get dirty and the pieces more vulnerable to further damage if you leave them to one side and forget. Avoid the urge to try to repair objects yourself, you may cause more damage to the piece. It is common for owners and amateur restorers to use too much adhesive which then spreads over the surface and becomes hard to remove; pieces may slip out of alignment due to inadequate support during the adhesive's setting time.

CARE AND CONSERVATION OF CARVED STONE AND SCULPTURES

Carved stone is found in many forms – it can be sculptural, architectural, ornamental or simply functional. It can usually be thought of as any piece of stone which is cut in three dimensions to form an irregular shape. Our country has a wealth of stone sculptures and monuments. Our temples bear testimony to both our sense of value and also ignorance regarding the protection of stone sculptures.

If you have a garden with sculptures or a significant collection of stone decorative pieces then this chapter will guide you how to protect them. Sculptures and carvings are made from a variety of stones. Limestone and sandstone are the principal materials but within each of these categories, there is a substantial variation both in appearance and behaviour. Many other stones such as granite, marble, khondalite, laterite, quartzite, shale, soap-stone and alabaster have also been used depending on geography, availability and cost.



Types of Deterioration of stone

Stone is susceptible to all three kinds of deterioration factors such as physical, chemical and biological factors. The extent of decay of stone sculptures is dependent upon the climate of the region as well as whether it is exhibited indoors or outdoors. Major problems and symptoms noticeable are surface soiling and staining, cracks, layers splitting especially in sandstone, crumbling of surface into powder and the more complicated puffy outgrowths due to salt efflorescence.

Environmental deterioration

This is usually - but not always - found on external stonework and stone sculptures in the garden. It is caused by weather erosion, the effect of pollutants, salt crystallisation, biodeterioration, and by repeated wetting/drying cycles. Stone that is kept in a damp or exposed environment may be particularly susceptible. The most important thing you can do is to identify, be aware of and monitor any carved stone - often it is part of a larger architecture and thus is not as immediately visible or accessible as in a single sculpture. Once identified, simple checks can be made to see if it is cracked

or showing signs of decay or damage. Remember, decay is usually a slow cumulative process, so regular inspection is an invaluable tool.

Biological deterioration

Moss and lichens grow on stone under shade and humid environment causing green and black colourations which ultimately weakens and stains the stone. Washing with neutral soap solution mixed with dilute ammonia can get rid of the problem. The stone has to be thoroughly washed with water after this treatment.

If your stone carving is deteriorating because it is being kept in a damp location or somewhere directly susceptible to the weather, you could consider re-locating the item or protecting it. Great care should be taken when moving stone, as the carved areas will be delicate. In many cases, *in situ* repair will need to be carried out because of the location or bulk of the stone.

Human neglect

This is most commonly brought about by inappropriate repair and vandalism. For all types of stone, the use of a hard repair medium such as cement can be detrimental and lead to accelerated decay of the original; this is often found as a powdering of the stone adjacent to the repair. Vandalism and graffiti are increasingly prevalent causes of damage brought about by social problems, lack of lighting and insufficient protection.

Cleaning

Surface dirt on a stone is not usually a problem except from an aesthetic view. The surfaces of carved stones should therefore not be regularly cleaned, as the action of cleaning can cause accelerated deterioration (especially to sandstones) or re-soiling by opening the pores of the stone. Any cleaning should be carried out using gentle means such as bristle brushes and water but not aggressive detergents.

MARBLE

Marble is a beautiful polished form of limestone that is used for tabletops, floors, countertops, walls, steps, fireplace facings, and statues. It comes in a variety of colors and has either a shiny or a matte finish. Marble used for floors, tabletops, countertops, and steps should be sealed with a special stone sealer to reduce its porosity. Protect marble tabletops with coasters, and wipe up acidic food spills immediately to prevent permanent surface etching and stains. Wipe marble surfaces with a sponge to remove light dirt. Do not use an abrasive or caustic cleaner on marble. Do not use oil polish or soft wax, because they will discolor the marble. Mild detergent mixed with ammonia solution can be used to remove stains and oxalic acid to clean rust stains. However consult a Conservator if you are not sure about these procedures.

CHAPTER - 7

CONSERVATION OF COMPOSITE OBJECTS

A composite object is one made of more than one kind of material and the potential for harmful interaction between their components is very high. For example, when a metal and a non-metal are joined closely together, deterioration of both components is often accelerated. Iron in contact with wood will corrode much more quickly than by itself, and at the same time the structure of the wood will be attacked. Similarly, copper or brass attached to leather will experience accelerated corrosion. Organic materials such as hardwoods and leather are often quite acidic which causes metals in contact with them to be attacked. Also, materials used in maintaining artifacts (for example, leather dressings) can encourage corrosion. In this chapter, we shall discuss about the preservation of composite materials such as oil paintings, archaeological and ethnographic artefacts.

CARE AND CONSERVATION OF OIL PAINTINGS

Oil paintings on canvas are a complex structure made of many different materials. These include: varnish, paint, glue, canvas, wood, metal, gilding and plaster which is easily damaged if knocked or dropped. They are sensitive and vulnerable to damages caused by, the surrounding environment, particularly extremes and changes in humidity and temperature, as well as by light and dirt. Life of a painting depends on the condition of its display, sensible handling and storage.

Identifying the problems

Paintings can be damaged in many ways. The canvas may have tears, holes or split at the edges. The painting might have developed sagging canvas, bulges or dents. In case of panel paintings, you may see splits, warps and cracks in the wood; the wood will also be susceptible to insect damage (e.g. wood worm). Termites may attack and destroy the frames and panels. There may be areas of cracked, loose or flaking paint, lost paint, or fading. Often old paintings have a yellowish or brownish hue which is due to the ageing varnish coat combined with accumulation of dirt and dust. Mould or mildew cause stains and weakening of the canvas structure.

Many of the problems identified above are caused (or made worse) by poor environmental conditions. Most of the materials in a painting respond to changes in



relative humidity and temperature by expanding and contracting. If the relative humidity keeps on changing then the painting will expand and contract repeatedly; the structure will become stressed and begin to fall apart. Paint layers may crack, canvas may split, wood may split and paint flake off.

In a museum the environment can be controlled with air conditioning (normally to a relative humidity of 55% (plus or minus 5%) and temperature of 20°C (plus or minus 3°C) – colder if human comfort is not an issue), but this is not usually an option in the home. In the home, a painting can suffer quite easily from high and low humidity.

Light and dirt can also cause problems. Too much light can fade certain colours and will speed up the darkening of varnish, the more light the faster this happens. Dirt looks unsightly and may be very acid. Acid will speed up the breakdown of canvas and wood making it very brittle and vulnerable to knocks and blows.



What you can do to protect your paintings

Moving and handling

Tears, holes, scratches and dents are most likely to happen when your painting is off the wall. Plan ahead about where to put your painting before moving it so that these damages can usually be avoided. Ideally when off the wall, paintings should rest face out against a clear wall on a padded surface, away from doorways, furniture and passing people. Always make sure your hands are very clean and dry before moving a painting and make sure the painting is securely fitted into the frame. When carrying your painting, have it facing towards your body and use both hands, one to hold the edge and the other to support it from beneath. Paintings with glass or ornate frames can be heavy, assess whether how many people will be needed to carry. Think ahead about whether the painting will pass through any doorways. Take measurements beforehand.

Hanging your painting

Choose the right place for hanging your painting. Avoid hanging close to shelves, furniture or behind doors, or in busy corridors where the painting can get knocked. You should also think about the environmental conditions in which your paintings hang. The following points are worth considering when hanging your paintings if you want to take steps to ensure the best possible environmental conditions.

Try to avoid hanging over direct heat or moisture sources, for example, right over fires, radiators, heaters, hot water or central heating pipes; in bathrooms, kitchens or around swimming pools.

Avoid hanging over or next to outdoor vents, or on damp walls. Avoid hanging in rooms that are well heated in the winter (paintings on wood are the most vulnerable). Picture lights attached to or near to

the top of a painting can get hot and lead to localised heating. It is best to take advice on lighting. Bear in mind that paintings will build up dirt more quickly in rooms with an open fire or where people smoke. Large canvas paintings which are hung high up on the wall are good to look at but pose a lot of maintenance problems. One may not like to climb up a ladder and clean them daily which naturally leads to neglect and buildup of dirt. Never forget to cover them while you are whitewashing or repainting your home. Paint spills are very difficult to remove. Think about the security of your painting, and take the following steps to ensure that it is hung safely. Hanging fitments should be fixed to the sides of the frame, not the top. Choose a thick and solid part of the frame. Make sure screws are secure but do not push them through the front. Use good quality picture wire which can carry the weight of the painting. Support must be given from below in case of excessively heavy paintings.

Housekeeping

As with all objects in your home a painting will collect dust and dirt. Dust can be removed using a very soft brush with metal elements protected so that they cannot be a cause of damage. Avoid feather dusters, sheep skin dusters, however soft, as they catch. You must be careful to check that there is no paint flaking before dusting. Do not attempt any dusting if the surface appears unstable. Never use water to wipe away dust and dirt.

If your painting has glass this will need cleaning from time to time. Always spray glass cleaner onto the cloth, not the glass. Spray well away from your painting. The use of backboards is recommended as a preventive conservation measure to protect against the accumulation of dust and dirt, as well as against knocks and accidental damage.

Consulting a conservator

There is much that you as an owner can do in terms of preventive conservation which will slow the deterioration of your painting and protect it from accidental damage. However there are many occasions, particularly those involving interventive treatments, in which the services of a trained paintings conservator are invaluable. Do not attempt any repair or cleaning yourself. This is a skilled process and should only be carried out by a fully qualified conservator.

Government Museum, Chennai offers consultancy services regarding conservation of paintings on canvas and other types of artwork to seeking institutions and individuals. The Curator of the conservation section may be contacted after fixing an appointment through the Museum office with a written application.

Care and conservation of frames and gilding

Picture frames and gilded objects are often more complex than they first appear to be and can be made up from a wide variety of materials. Generally, ornament in relief is made from either carved wood, moulded cast or hollow papier-mâché, also cast from moulds and applied to a substrate.

The materials and techniques of a gilded finish can vary enormously from one piece to another; note that other varieties of metal leaf than gold may be used. The base for the gilding is likely to consist of a hard white coating of chalky appearance - commonly called 'gesso' - covered with 'water-gilding', which is water-soluble or 'oil gilding', which is not so readily water-soluble.

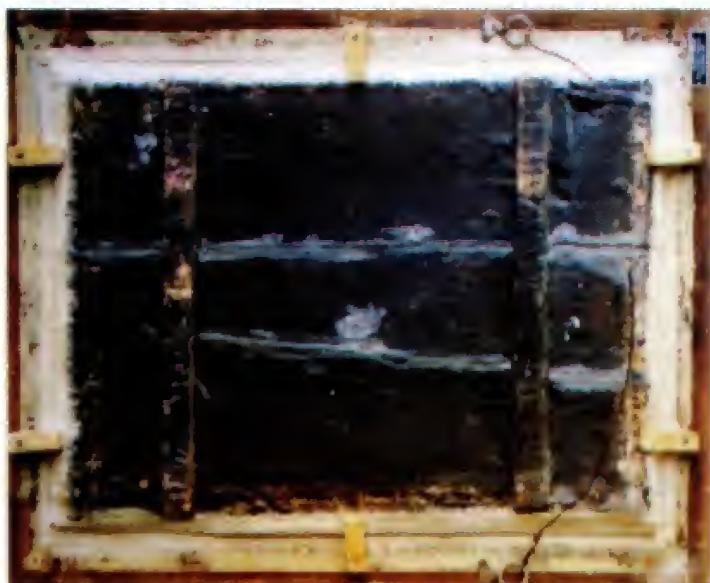
Effects of changes in environment - heat and humidity

Changes in the environment can cause movement of timber and applied finishes, resulting in the opening up of structural joints and cracking of the finish. The appearance of cracks in a gilded surface around the mitred corners of a picture frame may not necessarily be a real cause for concern, but should be carefully monitored and assessed, as major opening or loose joints can put frame and picture at risk.

The appearance of cracks in the gilded finish is a common symptom of ageing and not normally a cause for concern. If however the gold and gesso layer is lifting, loose, or falling flakes appear, this may indicate that the gilding layers are delaminating from the substrate. Cracks in the applied composition ornament are also a common symptom of age-related shrinkage, but be aware that this could lead eventually to detachment of the ornament.

Pests and moulds

The common furniture beetle (*Anobium punctatum*) is the most frequent cause of pest damage to gilded objects with a wooden substrate, evidenced by 1-3 mm diameter flight holes in the surface of the item. The extent of damage underlying the finish will vary, but may be extensive enough to weaken the object's structure. Inactive woodworm may cause concern structurally and aesthetically; active woodworm can and should be treated immediately. Wood-rots and moulds on the wood or gilding can also cause staining and structural damage where the item has been stored in or subject to wet or damp conditions.



Wear & tear and old repairs

Frames and other gilded items are subject to the usual degree of wear and tear resulting from life in a domestic or gallery environment – examples are surface damage from minor scratches, dents and abrasion, or staining from accidental contact with water or other solvents. Gold leaf wear is apparent when the clay bole layer (often a shade of red) begins to show through the worn leaf on the most

prominent parts of the object. It is also common to see gilded surfaces stained and damaged by inappropriate cleaning agents used in the course of attempts at repair by amateurs. For these reasons it is best not to attempt any repair or consolidation yourself. A common result of amateur repair is 'gold' or 'bronze' paint applied to a gilded finish in order to cover damages or to brighten or even tone down the gilding. The paints are made with non-gold metal powders which can oxidise and change to brown or green; they can be identified as a muddy, slightly granular, streaky coating against the bright sheen of real gold leaf. Beware however that in some cases, non-gold metal leaf and 'bronze' paint may be part of the intended original finish of an object.

Monitoring

It is a good idea to monitor an object's condition at regular intervals. This can be as simple a process as writing down the position of any areas or signs of damage (such as new flight holes) on an annual basis.

Moving

Keep moving or handling of gilded objects to a minimum. If moving cannot be avoided, you should wear vinyl or latex snug-fitting gloves, as oil or moisture from the hand will damage the finish on a frame. Make sure there are enough people to lift it slowly and safely if it is heavy, preferably lifting underneath a frame's lower member to avoid putting too much pressure on the joints. Make sure you have a space prepared to take the frame to before you start. If you are moving smaller objects, they should still be moved one at a time.

Cleaning

Keep cleaning to a minimum; dusting once per year is enough as the action will gradually wear away the gilded surface. Even the dust itself being moved off will cause some abrasion, so a very soft-haired brush should be used. The brush's metal ferrule should be wrapped in tape to protect the object against accidental knocking. Dust can be collected using a vacuum cleaner set on minimal suction, lifting the dust with a small nozzle covered with a piece of gauze secured with an elastic band. This ensures that no pieces of loose ornament are lost. Care should be taken not to touch the object with the nozzle.



Storage

Store and display gilded objects away from direct heat sources such as radiators or fires. Likewise, avoid placing them against or near a wall or surface that has - or may be at risk from - damp or leaks. Gilded objects are fragile and should be displayed away from major thoroughfares or anywhere where they may be vulnerable to knocks, such as behind doors or directly behind the backs of chairs. Always make sure objects are properly secured to the wall or relevant area.

Condition of Oil Paintings on Canvas Before and After Conservation Treatment
(Collection - Government Museum, Chennai.)



CARE AND CONSERVATION OF ETHNOGRAPHIC OBJECTS

Ethnographic objects are artefacts which have been collected from indigenous communities around the world. They are made from both organic materials - those derived from plants and animals - and inorganic substances like metals, glass and mineral pigments; organic and inorganic are often found in combination. These might be local and traditional materials, or may have been obtained through trade; they might well include modern materials such as plastics.



Many materials found in ethnographic objects - such as bark, wood, textiles, terracotta, grass, bamboo, hides and skin, metals etc. These objects frequently have little associated documentation about how they were made, used or collected so it is especially important to ensure that any information contained within the object is preserved. Objects may also incorporate human remains, such as teeth, bones or hair, and this can raise ethical issues, as can the ritual or sacred associations of an object.

Causes of damage – things to look out for

Ethnographic objects are susceptible to damage and deterioration from environmental, physical, chemical and biological sources. The combination of materials present in a single object can often accelerate chemical deterioration, for example deteriorating glass beads on leather, or corrosion products from metals on wood. Look out for:

Metal corroding, glass breaking down and fracturing or staining surfaces, embrittlement of plant materials coloured with iron-rich muds or dyes. All these indicate that conditions are too damp.

Pest damage from rodents, insects (e.g. carpet beetle larvae 'woolly bears', clothes moth, silver fish, wood-boring insects) or moulds and bacteria. These can cause both structural and surface damage as well as staining, and are also encouraged by high relative humidity levels.

Splits in wood and plant materials, and stiffening or warping of previously flexible materials such as hide, skin, textile, feathers or plant-based substances. If humidity levels are allowed to fluctuate, this can lead to materials becoming embrittled and fragmentary. Painted surfaces or coatings deteriorating, flaking or softening; layered structures such as barkcloth may delaminate. Structural damage due to lack of appropriate mounts or physical support.

What is dirt?

You may be tempted to "clean" a dirty-looking ethnographic object, as you would a domestic artefact. Ask yourself first – what exactly is it that will be removed in the cleaning process? It is important to distinguish between the different types of soiling present on an object; some deposits may be from the original setting, or may derive from the original use of the object: for example smoke, food residues or

ritually-applied substances. This "dirt" is actually unique and irreplaceable information about your object's history. There may well be more recent soiling accumulated since the object was collected which can be safely removed - but can you really distinguish these two?

What can you do to prolong the life of your object or collection?

Improve the environment

- These objects need to be stored and displayed where they are protected from extremes of heat, cold, dampness and dryness and from high light levels. Keep them where they are not subjected to fluctuations of humidity and temperature.
- Ultra violet radiation (from daylight) is particularly damaging, causing discolouration and embrittlement of many materials. The effect is cumulative, so keep exposure low.
- As ethnographic objects are often made from a combination of materials, they require a stable humidity and temperature environment.
- Objects should be kept away from external walls, and away from direct sources of heat and light.

CARE AND CONSERVATION OF ARCHAEOLOGICAL MATERIALS

Collections of objects housed in museums and in private ownership are normally referred to as 'archaeological' if they have been found buried in the ground or recovered from under water. They can be of any age, from Stone or Bronze-Age axes to terracotta, potteries, ceramics and figurines; Greek or Roman antiquities to cannon-shot and other objects from historic temples and monuments.

Archaeological objects are collected for different reasons, for their intrinsic interest, age, beauty or value, or because they are clues to the past and have relevance to the place where they were made, used or found. All these objects have some value within society and deserve to be treated with the level of care necessary to conserve them in as unaltered a way as possible. This helps realise their potential to inform, educate and please, both now and in the future.



Objects that have been buried react in a different way...

Hardly anything that has lain buried in the ground or on the seabed will have survived unaltered in some way - a combination of physical, chemical and biological factors will have been at work. Organic objects will rot, metals and glass corrode, and salts may build up inside ceramics, stone and other

porous materials. An object that appears in good condition may in fact be very fragile; delicate decorated surfaces may be obscured by hard corrosion or concretions; and the 'chemistry' within the object can often cause continued deterioration if not checked in some way.

Effects of previous treatments

Your object may have been "treated" in the past – this can be a direct cause of new problems. Using inappropriate chemical cleaners can strip off too much dirt and corrosion, destroying the original surface of the object in the process. Unless it is used in a controlled way and carefully removed after use, a cleaning material can go on acting on an object far into the future. Similarly, the application of oils, waxes and lacquers can do more harm than good by attracting dirt and airborne pollutants to the object's surface, and by sealing in other chemically-active by-products.

Handling, packaging, environment

Poor handling and inappropriate packaging present the most common threats to objects, often causing breakage and other physical damage. However, by far the greatest threat is long-term neglect. If unchecked, the effects of a combination of poor environment, inadequate physical protection and chemically unstable packaging materials gradually take their toll. The resulting damage may go unnoticed over a long period of time.

What you can do to 'stop the rot'?

Here are some basic do's and don'ts:

Keep direct handling of objects to a minimum, and when you do handle them, hold them over a table with a soft covering to avoid loss or breakage. Use only archival quality 'acid free' containers and packaging materials. Provide padding to stop objects moving about and to separate items within the same container. Provide a stable storage environment for metal objects by keeping them in airtight 'dry' boxes with renewable silica gel sachets and humidity indicator. Avoid attempting to clean corrosion or concretions from archaeological artefacts. Archaeological conservators are trained to have the knowledge, skills and equipment to do this effectively without harming the object. You may – inadvertently – be removing important information. It is best not to apply waxes or lacquers to any object unless you have taken professional advice beforehand. Incorrect application can do more harm than good. If attempting to clean dirt from antiquities such as ceramics, marble and stone, test-clean a small area first with warm water and a cotton bud - is there softening or loss from the surface? If it is safe to proceed, a little mild non-ionic detergent may be used. Swab clean areas with small amounts of fresh water and allow to dry slowly and naturally. Do not immerse the whole object in water.

CARE AND PRESERVATION OF REMOVABLE DIGITAL AND ELECTRONIC MEDIA

Digital and electronic technology is, these days, in a state of constant change. Tried and tested products are soon replaced by smaller faster varieties, sometimes with a life span of five years or less. Given the inevitable obsolescence of many digital and electronic products, you need to follow basic preservation guidance to ensure long-term access to information. This guidance note provides advice on the care, handling, and storage of several of the most commonly used media: flexible magnetic disks, magnetic tapes and optical disks - CD's and DVD's.

The main types of removable electronic and digital media are:

Flexible Magnetic Disks



Generally speaking and as the name implies, these are magnetic disks housed in rigid or semi-rigid casing, usually in 3.5" formats. They have a lifespan of about five years and therefore should not be seen as an appropriate long-term storage option. Larger format 5.25" and 8" formats are now obsolete and any data on these should be copied to more recent media. All flexible magnetic disks are easily damaged and susceptible to accidental erasure and should not be considered as suitable for the long-term preservation of, access to, data.

Magnetic Tapes

These encompass a range of media comprising two components: a recording layer and the flexible substrate to which it is fixed, usually polyethylene naphthalate. Magnetic tapes are either housed within a cartridge, with one spool, or come in the form of cassettes that have two spools. Two common types are Digital Audio Tape (DAT) - a low capacity variety - Digital Linear Tape and Linear Tape Open are considered the more long-lasting and if stored and handled properly could last at least 30 years. Magnetic tapes on open spools are now considered to be obsolete and should be copied to other media such modern tape cartridges or optical media.



Optical Disks

The most common form of optical disk is the Compact Disc, available in read-only (CD-Rom), recordable (CD-R) and rewriteable (CD-RW). Recordable CDs include a dye layer and a metallic and reflective layer on a clear polycarbonate substrate. Various combinations of these components are available, although sources suggest that CD-Rs with a gold reflective layer and phthalocyanine-based dyes have a longer life span and are the most suitable for long-term preservation.



DVDs (Digital Versatile Discs) were first produced in 1996 and like other forms of optical discs are available as read-only (DVD-ROM), recordable (DVD-R and DVD+R). There are also a number of rewritable formats (DVD-RAM, DVD-RW and DVD+RW). Recordable formats use organic dyes similar to CD-R, although it is difficult to learn exactly what formulations are used. The long-term preservation of DVDs is not well understood, although recommendations for their storage and handling are similar to that for CDs.

What can go wrong

There are two principal reasons why the information contained on your electronic and digital media can become inaccessible: redundancy of the hardware and physical damage to the media itself. The effective lifespan of any electronic or digital storage medium is determined by two factors:

- its physical longevity
- the currency of the technology required to access it

The supporting hardware necessary to read digital and electronic media usually has a shorter life than the media itself. Nevertheless, electronic and digital media is susceptible to damage both through mishandling and inappropriate storage conditions and by storing media in proximity to electromagnetic fields.



Preservation of your own collection

Physical protection, careful handling and appropriate storage conditions

The preservation basics for audiovisual records are much the same as for any other archival format. Keep them in a clean, stable environment that is cool and dry. A variety of enclosures for many of the more common formats is available from archival storage suppliers. Avoid touching the surface; it can easily become scratched. Salt and greasefilms from fingers are equally destructive. Lint-free cotton gloves should always be used when handling certain types of sound and

moving images, particularly motion picture film and open-reel audiotapes, because these records can be very susceptible to damage from fingerprints.

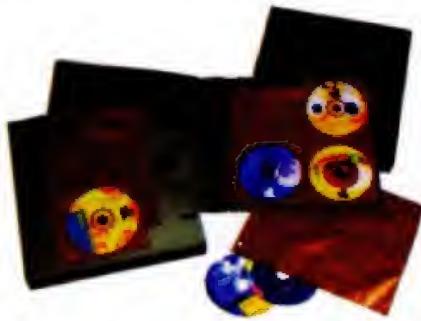
Protect electronic and digital media from liquids and dust, as well as extreme heat or direct sunlight.

Store electronic and digital media vertically in purpose-made storage containers. Rigid containers are preferable to sleeves.

It's also very important to keep the playback equipment in good condition as damage can occur if a machine is not operating properly.

Clean drives routinely to prevent damage to the media; do not keep media in drives though.

Apply labels only to the areas recommended by the manufacturer.



Copying to new formats

To ensure long-term access to your own electronic or digital collections, periodic copying to new formats is well advised. After reformatting, it's a good idea to keep your original materials because a better means of transferring the original material to a new format may become available in the future.

Flexible magnetic disks

Flexible magnetic tape surfaces should not be opened or the tape surface touched.

Magnetic Tape Cartridges

Magnetic tape cartridges must not be opened or the surface touched.

Tapes should be subject to a full forward and rewind cycle to equalise tape tension. Tape cartridges should be completely forwarded and rewound.



Optical Disks

CDs should only be handled by the extreme edges or the centre hole; the recording surface should not be touched.

Store CDs in rigid high quality cases made from inert polyester is preferable to sleeves since a rigid case offers better protection.

CARE AND CONSERVATION OF PHOTOS



Whether it is paintings on cave walls or writings chiseled in stone, mankind has been recording history since the beginning of time. The ability to document history photographically is a more recent invention, however, beginning with the daguerreotype in 1838. Photographs provide a very important visual connection to our ancestors. Shared family physical characteristics, hairstyles, clothing styles, family traditions, special events and more provide a graphic portrayal of the lives of our ancestors, but if we do not properly care for our photographs, some of our history will fade away right along with those precious images.

What Causes a Photo to Deteriorate?

Environmental factors such as temperature, humidity and sunlight affect photographs more than any other factor. Cyclic conditions (high heat and humidity followed by cold, dry weather such as you would find in an attic or basement) are especially bad for photos and may cause cracking and separation of the emulsion (image) from the support (paper base of the photo). Dirt, dust and oil are also big culprits of photographic deterioration.

What to Avoid When Storing & Handling Photos

Dirt, dust, and oils from your hands can cause permanent damage. You should handle prints and negatives along the edges, preferably while wearing white cotton gloves. The worst places to store your photographs is in an un-insulated attic or basement. Constant high temperatures and humidity in the summer and low temperatures and humidity in the monsoon can cause your photographs to become brittle and crack. In severe cases, it may cause separation of the emulsion (image) from the support (paper base) of the photo. Dampness can cause photographs to stick together. Insects and rodents, commonly found in basements, also like to feed on photos. The best conditions for storing photographs are in a location with a consistent temperature from 65°F-70°F with a relative humidity of about 50%. Do not store your negatives in the same place as your photographs. If something happens to your photos or albums, your negatives will still be available to reprint your treasured family heirloom.



I can't tell you how many times I have heard the phrase "I wish they had written on the backs of these photos who the people are." Don't do a similar disservice to your descendants, make sure the important family events are preserved for them. But write lightly with a soft lead pencil on the back of the image. Do not write on the back of your photos with standard ball-point or felt-tip ink pens. Unless it is made specifically for use on photos, most ink contains acids which will eat away at and stain your photos over time. Do not use rubber bands or paper clips to hold photos together. Rubber bands contain sulfur which can cause your photo to deteriorate. Paper clips can scratch the surface of your photos or negatives. Do not display important photos in your home. The glass can stick to the emulsion over time. Sunlight will cause your photo to fade. If you want to display a precious photo, then have a copy made and display the copy! Do not use glues (especially rubber cement) or pressure sensitive tapes to mend photographs or hold them in albums. Most glues contain substances such as sulfur and acids which will cause your photos to deteriorate. Avoid exposing photographic materials to anything containing sulfur dioxide, fresh paint fumes, plywood, cardboard, and fumes from cleaning supplies. Simply it means safe storage.



Water and fire can ruin your photos. Keep pictures away from fireplaces, heaters, dryers etc. Avoid water damage by storing photos on high shelves well away from water pipes and in locations not prone to flooding or leaks (don't store in the basement or in a closet which backs on a shower, tub or sink). It is wise to be strict about not having refreshing drinks or snacks while sharing your precious photos with friends or relatives in get-togethers. Avoid cheap photo albums and paper and plastic storage products that aren't specifically made for storing photos. Regular envelopes, ziplog bags and other things commonly used for photo storage aren't always safe for your photos. Use only lignin free, acid free, un-buffered paper for storing photographs or as interleaving paper in albums. Use only PVC-free plastics such as Polyester, Mylar, Polypropylene, Polyethelyne and Tyvek.

Taking care of Old Photo Albums

We may possess Family Photo albums in which the vintage black and white photographs were glued to the black pages. Some of the reasons that this paper was very bad for storage was that it contained a sizing chemical which had a high acidic content, it contained lignin which breaks down into acids and peroxides, and the black paper was made black from dyes which are also destructive agents. In addition to the paper problem itself, some of the glues used had a high acidic content as well. In addition to the backs of the photographs being attacked by all this acid and other chemicals, the front of the photographs frequently came in direct contact with the black paper from the adjacent side of the album when the page was closed. One simple solution to this problem is to remove the photographs

from the album. While this will certainly preserve the photograph, it does nothing to help preserve the memories or the integrity of the album. After all, there is usually some important information written in the albums describing the photographs and if the person that wrote in it is a relative, it is nice to have their handwriting preserved as well as the photographs. An easy and inexpensive alternative is to use a piece of acid free paper in between each page to prevent the migration of acids from the paper to the photograph. This technique is called interleaving and the paper can be purchased at any archival supply house. A similar method is to purchase sheets of Mylar and slip these in every page of the album. This is known as encapsulation. While this is more costly, it has the advantage of allowing you to see both sides of the page without removing the interleaving sheet.

Care of Colour Photographs

Black and white photographs, when processed properly and stored correctly could last 100 to 300 years. This we know is true because even today we have photographs that are over 150 years old and some of them are in excellent condition. Part of this is because black & white uses metallic silver as the image former and as long as nothing corrupts the silver, it is a permanent element. This is not true in the case of color photographs as the color is formed by dyes. The sun causes the dyes in a color photograph to fade. This change happens very gradually and you usually will not notice the change until one day you examine the print and notice that your relatives never had green faces.

The best and proper way to store color photographs is in a dry, dark chamber and the temperature should be below zero degrees Fahrenheit. Although the sun and its Ultra-Violet rays are most harmful to the preservation of color photographs, heat and humidity will accelerate the deterioration of the dyes. Not only is the sun and its Ultra-Violet rays very harmful, so is regular fluorescent lighting. In fact, the only types of illumination that is recommended for viewing color prints is standard tungsten illumination. However, this too must be kept at a low light level to preserve the color photographs. If you have only one original color photograph and do not have the negative, you may want to consider having a color copy made and display the copy print. Store the original in a dark, cool, dry place. A second suggestion would be to have a black & white copy made and have it printed on a best quality archival fiber paper. My sincere advice would be, whenever you need to record some important life cycle event such as a wedding, graduation, birth, etc.....By all means shoot all the color you want to so that for your lifetime you will have the pleasure of remembering the event as it looked. However, for the sake of your children, grandchildren, etc. make sure that you or someone also shoots some black and white film as well!



CHAPTER-9

PREVENTION FROM THEFT AND LOSS

There is little point in creating the right environment for your valuable items if you don't make sure they are secure from theft. It is vital to have insurance, and remember that certain policies may require you to invest in extra security systems for your home. If you are burgled, you increase the chances of recovering your valuable items if they are marked for identification. Using an ultra-violet pen, write your postcode, house number or first three letters of your name on the piece. Be careful to write it somewhere that will not damage a valuable item.

Documentation of your antiquities

Also helpful in case of theft is a detailed inventory and photographs. It is best that you maintain a file about the antiques that you own with the following details

* type of object;	* materials and techniques used;
* measurements;	* inscriptions and markings;
* distinguishing features;	* subject;
* title;	* date or period;
	* maker.

This ensures your items can be identified quickly, and insurance claims will be substantiated. I advise that you include a ruler in the photo to give it scale, and focus particularly on features that are unique to the object. In our Museum the Rare Chola bronzes were 'fingerprinted' using X-Radiography which not only helps in tracing them if lost but also helps in authentication and deter forgery. Keep records of any treatments that you apply to your objects, along with images, taken before and after such treatments so that in case there is any problem a Conservator will be able to identify and rectify it.

Registration of Antiquities

The Government of India have enacted "The Antiquities and Art Treasures Act 1972" in order to curb the smuggling of art treasures from India. To enforce this act effectively, Registering Officer and some supporting staff have been appointed in this department. Government of India meets the entire expenditure of this scheme. This scheme is being implemented in Tamil Nadu from the year 1974. Till date 42,358 antiquities have been registered and certificates issued in Tamil Nadu

How to register

To register an antique, the following procedures are to be followed

Any object considered to be an antique of more than 100 years comes under the Registration Act.

Application should be sent in a prescribed form (Form VII). Photographs in triplicate of front and back view of the object should accompany the application form VII. Certificates will be issued to the owner in Form VIII after physical verification of the antique by the Registering Officer.

Provision for transfer of ownership may also be made by furnishing the particulars in Form IX in triplicate throughout the country.

THE ANTIQUITIES AND ART TREASURES RULES,1973.

APPLICATION FOR REGISTRATION OF ANTIQUITIES

See Rule – 11

1) Name of the applicant (person) :
2) Address of applicant (person) :
3) Identification and description of object
With three copies of photographs in
Post card size :
4) Material :
5) Size :
6) Approximate date (Age of the Antiquity) :
7) Source of Acquisition :
8) Where the applicant has come into
ownership control or possession of any
antiquity which is already registered
under the Act, registration number of
such antiquity and the name of
registering officer, who had registered it :
9) Date of acquisition :
10) Mode of acquisition :
11) Price paid, if any :
12) a. Present Location and :
b. Condition or preservation and security :
13) If the antiquity is already registered under
the Act, whether its registration certificate has
been attached. :
:

I declare that the above information is correct and complete to the best of my
knowledge and belief. I also undertake to observe the provisions of the Antiquities and
Art Treasures Act, 1972 and the rules made thereunder.

Place:

Date :

Signature

1. If the application is on behalf of an organization, the name thereof should be
given.
2. If the application is on behalf of an organization, the signature should be that of
the head of that organization

THE ANTIQUITIES AND ART TREASURES RULES,1973**CERTIFICATE OF REGISTRATION OF ANTIQUITIES**

(See Rule 12)

Whereas

resident of

..... has applied for registration of the antiquity / antiquities mentioned below, and has undertaken to observe the provision of the Antiquities and Art Treasures Act, 1972, and the rules made thereunder.

I, Registering Officer, do hereby grant this certificate under section 16 of the said Act to the said

..... for the object described below together with authenticated Photographs.

1. Name of the Object	:
2. Material	:
3. Size (height and width)	:
4. Approximate Date	:
5. Location	:

The certificate is granted subject to the provision of the said Act and the rules made thereunder and is further subject to the condition that in the event of change of location of antiquity from area of registration to another or its sale the fact must be communicated by the owner to the Registering Officer, with the name and address of the person/firm to whom/it was sold or gifted.

Seal of Office :

Signature

Place :

Name of Registering Officer

Date :

Designation

“FORM IX”

TRANSFER OF OWNERSHIP

(See rule 13)

N.B. 1. This form must be completed (in triplicate) simultaneously with the transfer of ownership.

2. One copy shall be sent to the Registering Officer concerned and the other two to the Director General, Archaeological Survey of India, New Delhi by registered post so as to reach them within ten days of transfer.

3. In case the object is an unregistered antiquity, each copy of this form shall be accompanied by a photograph (in sharp focus) of the object in post-card or quarter size. If the sides of the object are decorated differently than the front, the photographs, as stated above, shall be sent in respect of each such side also in addition to the front.

4. The responsibility for completion of the above formalities rests with the seller/giver if the object has been sold, gifted or donated; otherwise with the new owner of the object.

SECTION A (TO BE COMPLETED BY THE SELLER/GIVER)

1. Name of Owner :
2. Address of Owner :
3. *Licence No. :
4. Serial No. in Register :
5. Serial No. Album :
6. Name/Subject of Object :
7. Nature (e.g. Sculpture, Painting, Manuscript, Coin, etc) :
8. Whether it is registered?
If so
 - a. Name and Station of Registering Officer :
 - b. Registration No. :
9. Material :
10. Size :
11. Price offered :

Place :

Signature of Owner

Date :

Name (in block letters)
As signed and seal

* Applicable in the case of dealers only.

SECTION B (TO BE COMPLETED BY THE NEW OWNER)

1. Name
2. Complete address
 - i) Present
 - ii) Permanent
3. Mode of acquisition
4. (e.g. purchase, gift, inheritance, donation etc)
5. Safeguards for preservation and Security of the object
6. *Nationality
7. *Passport No.
8. *Duration of stay in India
9. *Purpose of visit

I hereby declare that the information given above by me is correct and complete to the best of my knowledge and belief. I undertake to observe the provisions of the Antiquities and Art Treasures Act,1972 and the rules made thereunder as in force from time to time.

I am aware that the object now acquired by me is an antiquity, that it cannot be taken or sent out of the territorial limits of India, except on the authority of a permit issued by Director General, Archaeological Survey of India and that any attempt to take or send it out of India without such a valid permit is punishable under the law.

Station :

Signature

Date :

Name (in capital letters)
As signed.

*Applicable in the case of foreigners only.

Fire Damaged Artefacts

Fire is one of the devastating agent of disaster to cultural property because of its potential to completely wipe out hundreds of antiques and artifacts in just a few minutes. Fire safety methods have to be stringently followed to prevent any accident. Make sure that you use standard electrical installation, fittings and equipments at your home. Never store inflammable materials close to your valuables. In case a fire has broken out, try to recover as many valuables as possible by prioritising and shift them to a safe place. Soot is the main visible component of a fire damaged artefact which has to be removed carefully.

Soot

Soot is a mixture of oil, carbon and tar compounds that represent the materials destroyed in a fire. The particle size is so fine that it is able to become lodged in microscopic cracks in the surface of an object and become electrostatically bonded.

Handling

Soot is a corrosive substance and its effects can be made worse if an object is touched with bare hands, the natural oils present in skin causing possible etching of metal surfaces for example. Handle objects as little as possible and wearing soft cotton or latex gloves when handling metals or any precious item is highly recommended. Handling will also result in compacting the soot layer, causing it to adhere more tightly to the surface and be driven further into the object. Ensure gloves are changed as soon as they become dirty to avoid the transfer of soot onto other objects.

Cleaning

Cleaning should be undertaken in three stages: vacuuming, followed by dry surface cleaning, and then wet surface cleaning as a last resort. Safety is important. Fires can release a number of hazardous materials (such as toxic chemicals and asbestos) which may become deposited on the object as part of the soot. It is important to take safety precautions such as wearing gloves whilst handling objects.

Vacuuming

Vacuuming is most effective if undertaken as soon as possible following a fire and before the object is handled. The vacuum nozzle should not come into direct contact with the object and should be used without any attachments or brushes which would only serve to drive the soot further into the surface.

Dry Surface Cleaning

Erasers such as vinyl erasers, mechanical vinyl erasers and eraser dust are very effective in removing soot from objects. Only white erasers should be used for cleaning objects as others may contain

materials such as fine glass particles that would damage the object further. Eraser dust can be easily made at home by using the finest grade on a cheese grater in the kitchen. Always remembering to wear gloves when handling the object, the dust can be gently massaged over the surface and should be changed as it becomes dirty. Document cleaning pads (available from art suppliers) are fabric bags containing very fine eraser dust – these may also be used for cleaning.

Wet Cleaning

Wet cleaning should only be attempted as a last resort. As soot is water repellent in nature it is necessary to use a detergent in conjunction with water in order to lift and remove the soot. Only a weak solution of a very mild, pure soap in water should be used. Stronger detergent solutions must not be used as this may lead to further damage. Solvents such as white spirits or methylated spirits may be used with extreme care and applied to the object with cotton wool swabs. As the use of water and solvents as cleaning agents may result in loss of colour from certain objects, spot tests should be conducted as the first step in cleaning before attempting the object as a whole.

Cotton swabs can be easily made by tightly rolling cotton wool around the end of a bamboo/wooden skewer. These are preferable to commercially available cotton buds as solvents can dissolve the plastic stalks, redepositing them on the object's surface.

The swab should be lightly moistened with either a weak solution of warm soapy water or a solvent then gently rolled across the surface of the object. Do not rub or wipe with the swab, as this may ingrain the soot and carbon further into the surface of the object.

It is very important that the object is never fully immersed in water or solvent. Immersion prevents any changes to the object being easily observed and limits control over any reactions taking place. Cleaning should always be undertaken slowly and methodically.

Treating Specific Materials

Wood furniture – wipe surface with cotton rags barely moistened with white spirits then buff with a clean, soft lint-free cloth.

Bronze – clean with solvent then buff dry as with wood furniture.

Metal and glass – clean with water and mild soap. Follow by rinsing with water and then methylated spirits. The methylated spirits will ensure that no moisture remains behind and the object is thoroughly dry. Avoid using water on iron-based metals, use solvents instead.

Ceramics – high fired wares may be treated in a similar manner to glass, but low-fired wares may require specialist treatment.

Smells – following cleaning, small objects can be placed in a zip-lock bag with baking soda, clay cat litter or activated charcoal which will absorb the smell over time. Isolate the object from direct contact with the absorbent material with a sheet of paper or plastic.

Repairs and mending of fire damaged objects should be left to a professional conservator.

CHAPTER - 10

CONSULTING PROFESSIONALS FOR HELP

Museums are Institutions which collects, preserves and displays objects of our glorious past, for the benefit and enjoyment of the public and for posterity. Among the various functions of the Museum, conservation is the most important activity in which remedial measures are taken to remove the defects present in the cultural object and prevent further deterioration by adopting proper preventive measures.

Established in 1851, Government Museum, Chennai is one of the oldest and finest Museums in India and the first State Museum to be equipped with a scientific Conservation laboratory way back in 1930 itself. Apart from taking care of the conservation of Museum objects, it has helped various other Institutions such as Archaeological Survey of India, HR and CE Department, Raj Bhavan, Madras university, Government Eye Hospital, Madras High Court, Fort Museum, etc. Several private institutions and non-governmental organizations approach this Laboratory for conservation of their collections and for imparting training to their staff. Government Museum Chennai is extending its conservation consultancy services to individuals also at very nominal costs and thereby performing its moral duty of preserving the cultural heritage objects of the country wherever they are.



All the guidelines provided in this book can be followed easily by any person who wishes to take care of the antiquities in their possession. However as I have cautioned already, it may be necessary to seek the help of a qualified conservator in some cases where, interventionist conservation treatment is essential to protect the object. One can send a written request to the Commissioner of Museums with details of the object along with photographs, and an undertaking that the object(s) belong to the individual/Institution and that it is not for commercial purposes. The Curator may also be contacted in person after prior appointment through the office.

TRAINING AND AWARENESS

Training is an educational process. People can learn new information, re-learn and reinforce existing knowledge and skills. It is a learning process that involves the acquisition of knowledge, sharpening of skills, concepts, rules, or changing of attitudes and behaviours to enhance the performance of the learner.

It is a pity that with our rich cultural history, we don't have enough trained and qualified people working on its preservation. There are more than 1500 restorers in UK but hardly 10 in India. Sufficiently large bodies of conservators and restorers adequately trained in conservation must be built-up for the immediate task of preserving our cultural relics through the centuries. Colleges can conduct awareness programs about conservation and make it mandatory for students to clean art pieces in temples and Museums. Universities must encourage research on traditional methods used in creating and conserving art.

The need for training in conservation and restoration is felt at all levels. Even professionals working in heritage conservation still do not have well-established theoretical and methodological foundations and precepts, and do not have, in our country, a specific academic training at either the undergraduate or graduate level. Some initiatives are being implemented in this respect, but the majority of these are insufficient in the number of classes or are too narrowly focused, rather than on a curriculum that values training administrators who will be able to develop strategies of preventive conservation as well as minimize the causes of degradation and stabilizing deterioration. There are very few Institutions and Universities in India which offer conservation training at Post-graduate level. This training must offer the students not only the command of the general and fundamental principles of preservation related to the conservation and restoration of material supports, but also allow the students to face new situations using modern strategies, methods and tools in the production of knowledge within the different fields of preservation.

Internship Training

An internship is an essential part of any training programme. A thesis or diploma paper should terminate training, and its completion recognised by the equivalent of a university graduate degree. Sanchita Balachandran, a conservator in private practice in USA, who did a research about the history of conservation of bronzes in this Laboratory advises students to try and get as much exposure on conservation by working as interns in different places. After a Masters degree in Art restoration, you have to do a lot of internships for the first couple of years.

Education and sensitization for conservation should begin in schools and continue in universities and beyond. These institutions have an important role in raising cultural awareness - improving ability to read and understand the elements of our cultural heritage - and giving the cultural preparation needed by candidates for specialist education and training. Practical hands-on training in craft work should be encouraged. It is a welcome practice nowadays that some colleges in the city have made compulsory for their final year History graduate students to complete a minimum of 35 hours of internship at Government Museum, Chennai as a requirement for getting the Degree. As mentioned already, the final year students of Government Fine Arts college, Chennai submit a thesis on Art Conservation at the end of their six months internship here which is a requirement prescribed by the Madras University. Colleges and Students who are interested in applying for internship at the Museum can write to the Commissioner of Museums.



Short-term training Courses

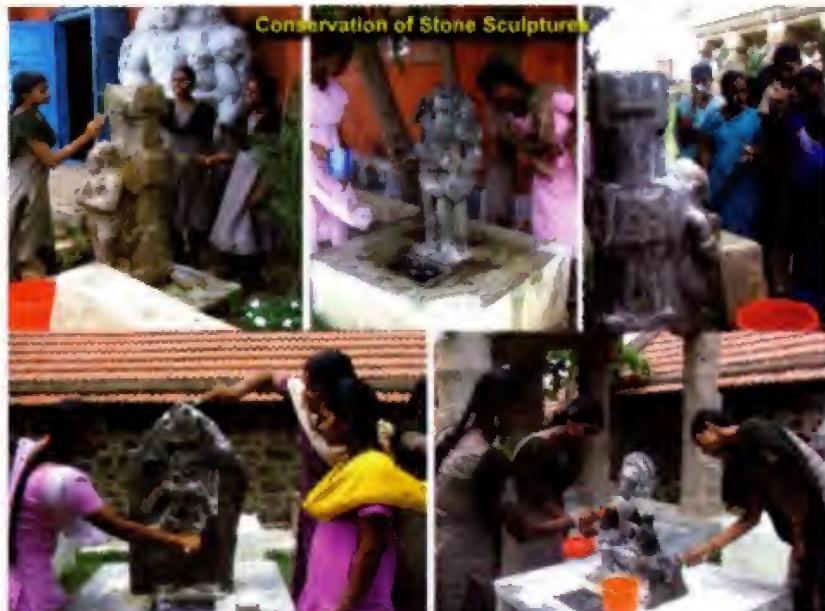
Although short-term courses cannot teach skills or impart profound understanding of conservation, they can enlarge attitudes and help introduce concepts and techniques of conservation in Heritage management.

For Museum Personnel

This Laboratory started a short -term training course on “**Care of museum Objects**” for training Museum personnel in 1974 – the first of its kind in Asia. Due to its popularity and demand it was extended to curators, conservators, librarians and staff from other cultural institutions throughout the country. This course is conducted during the month of June every year and has been continuing since without any break.

For College and school students

Hands on training on conservation of various artefacts such as bronzes, wood carvings, leather puppets, musical instruments, metal ware, Iron cannons, stone sculptures etc, is given to students of chemistry, history and archaeology both at the graduate and post-graduate levels through Government Museums at District Head quarters. The Curator and Conservation section staff undertake tours to different parts of Tamilnadu to teach the principles of conservation and create an awareness among the youngsters.



For Archivists, Librarians, Manuscripts custodians

This Laboratory has been functioning as a Manuscript Conservation Centre, under the National Mission for Manuscripts, New Delhi since 2004. Several 3 days and 5 days workshops on preventive conservation of manuscripts (paper, Palm-leaf and parchment) are being conducted regularly. A 15 days training course on curative conservation of manuscripts was organized in February 2011 for the benefit of conservators and librarians throughout the country.

For Research Scholars

Progress in scientific conservation as in other branches of science is based on fundamental research, but no matter what progress is made and what materials and methods are evolved in research laboratories, their application to the work of trained personnel cannot be over emphasized. This Laboratory is interested in conducting research on conservation techniques and has been collaborating with various research Institutions like IIT, Madras, Indira Gandhi centre for Atomic Research , Kalpakkam etc. In 1996, this Laboratory was recognized by the University of Madras as a Research Laboratory to carryout research leading to Ph.D degree. Internship programs both short term and long term are open to scholars who wish to update their knowledge in any branch throughout the year.

AWARENESS CREATION

Preservation of heritage is essential to sustain the identity or character of a community, a society and that of a nation. In a country as diverse as ours, with a long history and many languages, cultures and ethnicities, this assumes even greater significance as it can help bring to the forefront many of our dying indigenous knowledge

systems. Unfortunately, heritage preservation efforts in India have been inadequate, leading to damage and loss of much of whatever remained.

Museums are mobilising funds for conservation projects and also providing required technical and policy expertise. Other areas of activities include training of professionals and awareness creation programmes through workshops, exhibitions and publications, which I have discussed above.

How you can be a part of the effort ? All of us can be part of the effort to protect our heritage in a number of ways. Some of them are:

Donations: You can donate money for specific projects, such as the conservation of a particular building. If the amount required is big, you can donate a part of it or raise funds by involving people you know. Organisations will also let you sponsor some of their specific activities—such as events, newsletters or stalls at exhibitions, among others.

Volunteering: When it comes to volunteering, no technical expertise is required. "We need people who care". If you 'care', there will be lots of areas you can get involved in .We have Volunteers in our Conservation Laboratory who have been associated for more than 10 years. Ms.Dally Verghese from Chennai has been working in the textile conservation program.

If you have any special skill that you can offer, get in touch with the Museum. Tell them what you specialise in and they will find a right volunteering opportunity for you. Enrol yourself in the 'Heritage club' or 'Friends of museum.'

Participation matters. Above all, it is pride in our heritage and the responsibility towards it that matters. If there is history under threat in your vicinity—an endangered artefact, a historic building falling to ruins, an traditional skill that finds no takers commercially—get in touch with the local chapter of NGOs or your local museum, who can help.

Advocacy. Be vocal against practices that destroy heritage and spread awareness so that all come together to safeguard it. If required, use social media forums to get more people involved. Together we can make a difference.

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Government Museum, Chennai
Pantheon Road, Egmore, Chennai 600008.
Telephone : +91 - 44 - 28193238
Fax : +91 - 44 - 28193035



Email : govtmuse@tn.gov.in
Website : www.chennaimuseum.org